

Chemical Week

August 13, 1955

Price 25 cents



**Chemical industry sales rise
10% in first half; soar 31%
in July . . . p. 13**



**Chemical research in
Denmark . . . p. 20**

**Chlorine demand now outruns
supply, but a new government
plant will turn the tables . . . p. 46**

**U.S. Steel's Chlorwood, Montana:
the story of their probing, com-
mercial sorbic acid . . . p. 73**



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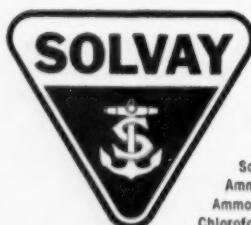
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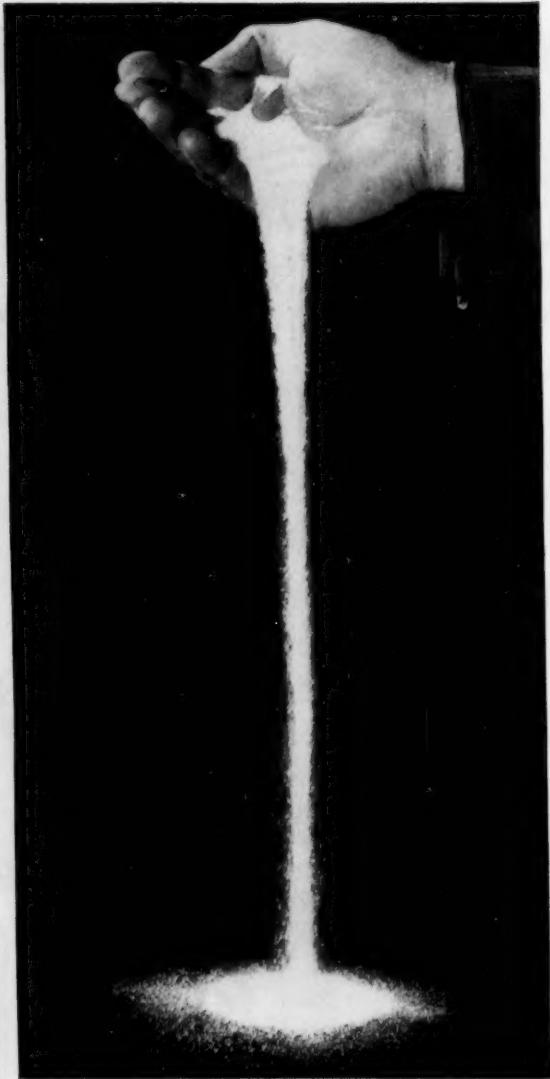
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Chemical Week

Volume 77

August 13, 1955

Number 7

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OPINION . . .

Orthology Lesson

TO THE EDITOR: In your July 30 issue, p. 15, you call the Monsanto-Lion Oil merger *fortuitous*. I have an idea the merger was not unplanned, accidental, and suspect you mean *fortunate*. See Fowler, p. 191.

K. A. SCOTT
Glen Rock, N.J.

We quickly consulted our Fowler's "Modern English Usage," concede that Orthologian Scott has us with our *fortuitous* slip showing. Clutching wildly for a small straw, we do point out that Webster's Unabridged uses the words "occurring unexpectedly" as part of its definition of *fortuitous*. We insist that the Monsanto-Lion Oil merger did occur unexpectedly.—ED.

What Repels a Horse?

TO THE EDITOR: No correction; no complaint; a praise any time you need one. What, then?

An inquiry!

Re: Vol. 77, No. 4, July 23, 1955, "Specialties. . .", p. 58: Chemical Scarecrows Boom.

Any good scarecrow against horses eating apples, pears, young fruit trees and old ones, roses, zinnias. . . ? (Not to forget tomatoes, parsley, etc.)

We (my girl friend and myself . . .) have three lovely horses—sort of pets, you know; we also ride 'em and win ribbons with them in horse shows—and about five acres on which we grow grass for them. But some foolish former owner planted some fruit trees around the place, and for the last five years (since I came) we also have tried at times to raise some such things as flowers around the house, or a few home-grown tomatoes, some spices or seasonings for the cookpots and so.

And then, we turn the horses loose to mow the lawn. While there's plenty of grass available, the two boys (geldings, if you should be familiar with "horsy" terms) just plain insist on chewing off the fruit long before it's even near ripe, or plain on eating the leaves of those—and any—trees. And the leaves of roses, thorns and all, they just love. And the girl (a cute little mare and otherwise my favorite)—as feminine as they come—has a sense for beauty; I just came in time the other day to see a pretty zinnia stick out of her mouth and then

disappear into it. She leaves fruit generally alone, though.

So, see above: any good scarecrow against horses?

They say they are creatures of habit, and I figure if we sprayed those trees and forgot about harvesting any fruit from them this year (which, under the above circumstances, we would probably have to anyway), the horses, keeping trying to eat, would eventually come to think that it just isn't worth bothering to even come and check up on the taste, and maybe come next year we would not have to spray, and they would leave the trees, etc., alone and we would finally harvest some fruit. . . ? (The pears, in particular, are awfully good!)

I would greatly appreciate your advice!

Thank you very much.

ILLO GAUDITZ
Tacoma, Wash.

What works on deer should work on horses, as far as we know. Any experts so inclined can reach Dr. Gauditz, delightful correspondent, at 7912 Orchard St. S.W., Tacoma 99.—ED.

DATES AHEAD . . .

American Soybean Assn., Natl. Soybean Processors Assn., joint meeting, Netherlands Plaza Hotel, Cincinnati, Aug. 29-31.

National Agricultural Chemicals Assn., annual meeting, Essex and Sussex Hotel, Spring Lake, N.J., Sept. 7-9.

Federal Wholesale Druggists Assn., annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., Sept. 11-14.

American Chemical Society, 128th national meeting, Minneapolis, Minn., Sept. 11-16.

National Petroleum Assn., annual meeting, Traymore Hotel, Atlantic City, Sept. 14-16.

American Assn. of Textile Chemists and Colorists, Atlantic City, N.J., Sept. 22-25.

Congress on Analytical Chemistry, Lisbon, Portugal, Sept. 9-16, 1956.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:
W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.



ENGINEERING
REPORTS:

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- Adaptable to existing plant set-ups
- Flexible in application
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- Easily maintained, durable and efficient

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GENERAL ELECTRIC



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G-E ENGINEERED DRIVES AND POWER SYSTEMS MEAN . . .

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IN THE NEXT TEN YEARS, production must increase an estimated 50% to meet greater consumer needs. Available manpower will increase only an estimated 14% during the same period.

INCREASED OUTPUT AND EFFICIENCY must close the production gap between available manpower and estimated demand. General Electric electrical systems are designed and installed for efficient, flexible, easily expanded production.

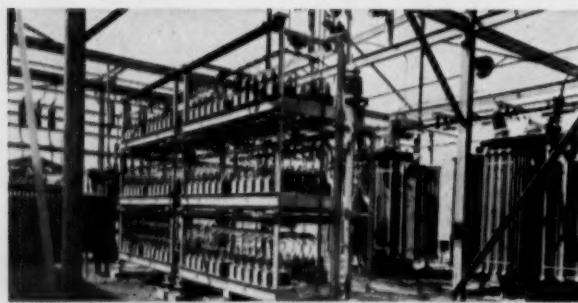
G-E ENGINEERING SERVICES (see back page) can help you meet production requirements to bring your electrical system up to date. The result is a modern system integrated into your present plant setup.

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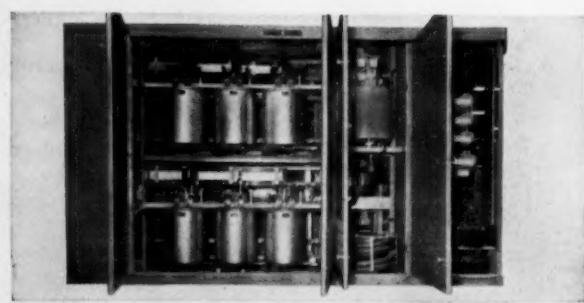
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Engineered Electrical Systems for Process Industries

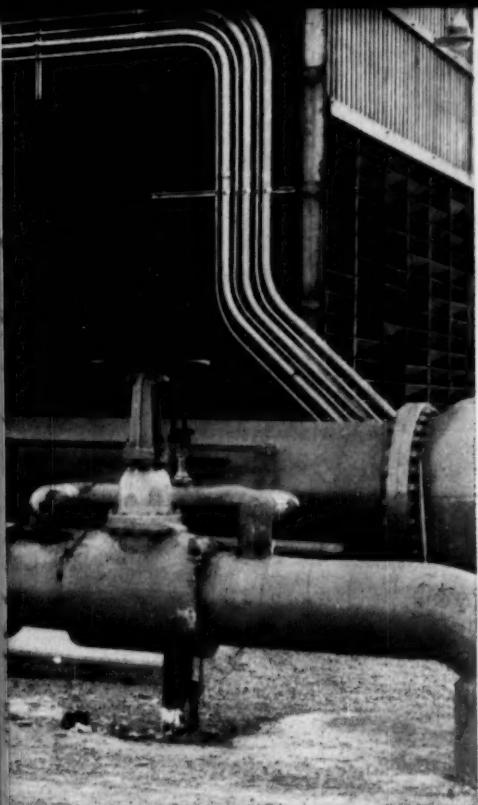
GENERAL  **ELECTRIC**



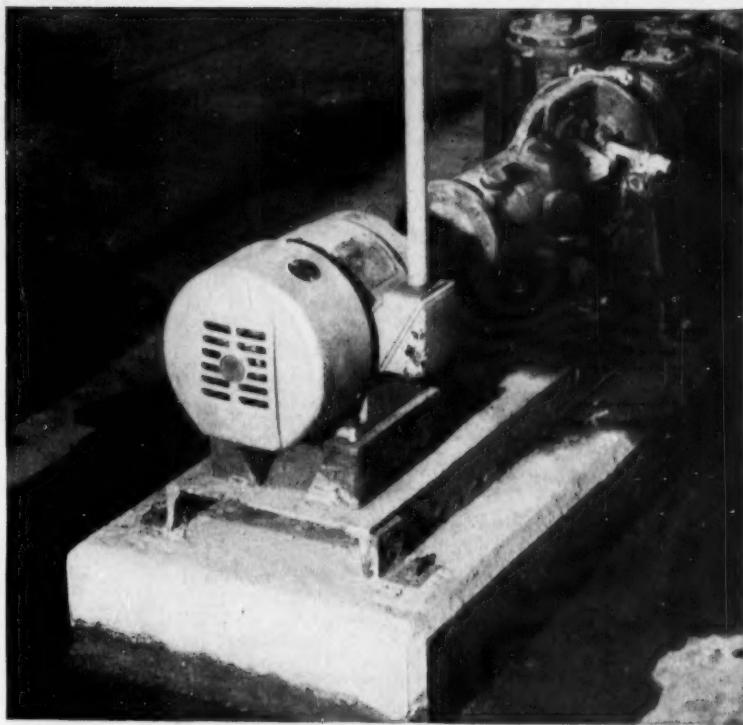
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HIGH EFFICIENCY and low installation cost of this pumpless rectifier provide more reliable and economical d-c power. Factory wired, the unit is ready when it arrives to connect and operate.



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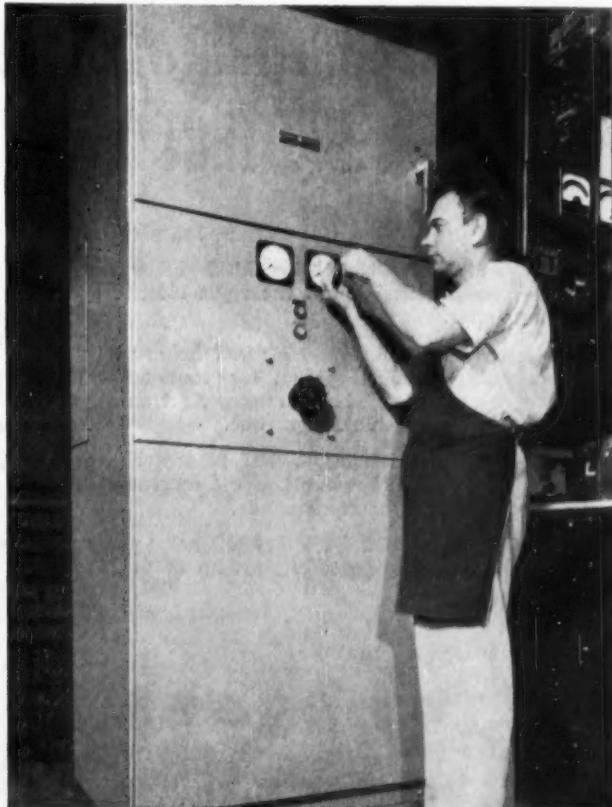
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Chemical Week

BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

After a hectic final week of political maneuvering, Congress left behind a string of unfinished business (much of it of vital concern to chemical companies) that promises certain fireworks in January.

Tax cuts, for example, are sure to set off the year with a bang. The big argument will be over how much of the cut will go to corporations—with both Republicans and Democrats jockeying for credit on “doing the right thing by the voter.”

Chances are good for early passage of a House-backed bill to exempt independent producers of natural gas from Federal Power Commission price control.

Gas price control, however, is always a highly explosive topic, could set off another long (and heated) Senate debate.

New, broader control over interstate waterways seems in the cards, but federal officials won't be given the last word on enforcement suits. States and other nonfederal agencies will be cut in on Administration duties.

Washington has just about made its mind up, too, on the future of tax amortization. Fast tax write-offs will be continued—but only for plants tagged “direct defense” or “direct defense-supporting.” In the first category: production facilities for military procurement (like alkylate for aviation fuel); in the second, no open chemical goals at all.

All other expansion goals still open (including glycerine, synthetic methanol, coke by-products, and titanium) will likely be suspended until a full-scale review of supply-requirement estimates has been made.

Requirements have just about jelled for businessmen serving as government advisors in Washington—the long-suffering WOCs (without compensation).

Hereafter, every WOC will have to make a public declaration of his business connections (in the *Federal Register*), listing names of all companies of which he is an officer or director—as well as stock holdings, bonds, or other financial interests he has held within 60 days preceding his appointment.

Each report will be subject to update every six months.

President Eisenhower has instructed the State Dept. to get ready for a new round early next year of tariff negotiations with foreign countries. On the tentative list of products (on which the U.S. will consider granting—or receiving—tariff concessions): a number of chemicals, most of them in the organic field.

The entire list must be published in early September (to comply with the law giving the Tariff Commission 120 days to study peril points) if the Administration hopes to get a New Year's start on its negotiations.

Canada, tacitly admitting that uranium ore production is out-

NEWSLETTER

stripping U.S. Atomic Energy Commission demands, has decided to suspend buying under special price contracts until next March 31.

Solvay Process Division, Allied Chemical & Dye Corp., will start construction immediately of a 100-ton/day chlorine plant at Brunswick, Ga. (Caustic output: 125 tons/day.)

Site of the plant is a 700-acre tract on Turtle River; Solvay hopes to be in production by Dec. '56.

Atomic energy expansion moves will soon be made in two Scandinavian countries, say sources close to their governments.

In Norway, plans are afoot to build a 10-20,000-kw. reactor at Halden (on Oslo Fjord) near the pulp and paper mills of the Sawmill Assn.

In Sweden, a second atomic energy research station is expected to get an all-clear signal this summer. Its site: Studsvik, near Nyköping, 50 miles southwest of Stockholm.

And atomic energy is also in for more industrial attention here in the U.S. Union Carbide and Carbon Corp. is setting up Union Carbide Nuclear Co. as a new division "to integrate the corporation's diverse activities in the atomic energy field," and to "intensify and expand" Carbide's position in that field.

In addition to keeping an eye on the Atomic Energy Commission plants that Carbide has been operating for the U.S. government, the new division will carry on "large-scale research and development activities." Its president: Kenneth Rush, a Union Carbide vice-president and lawyer.

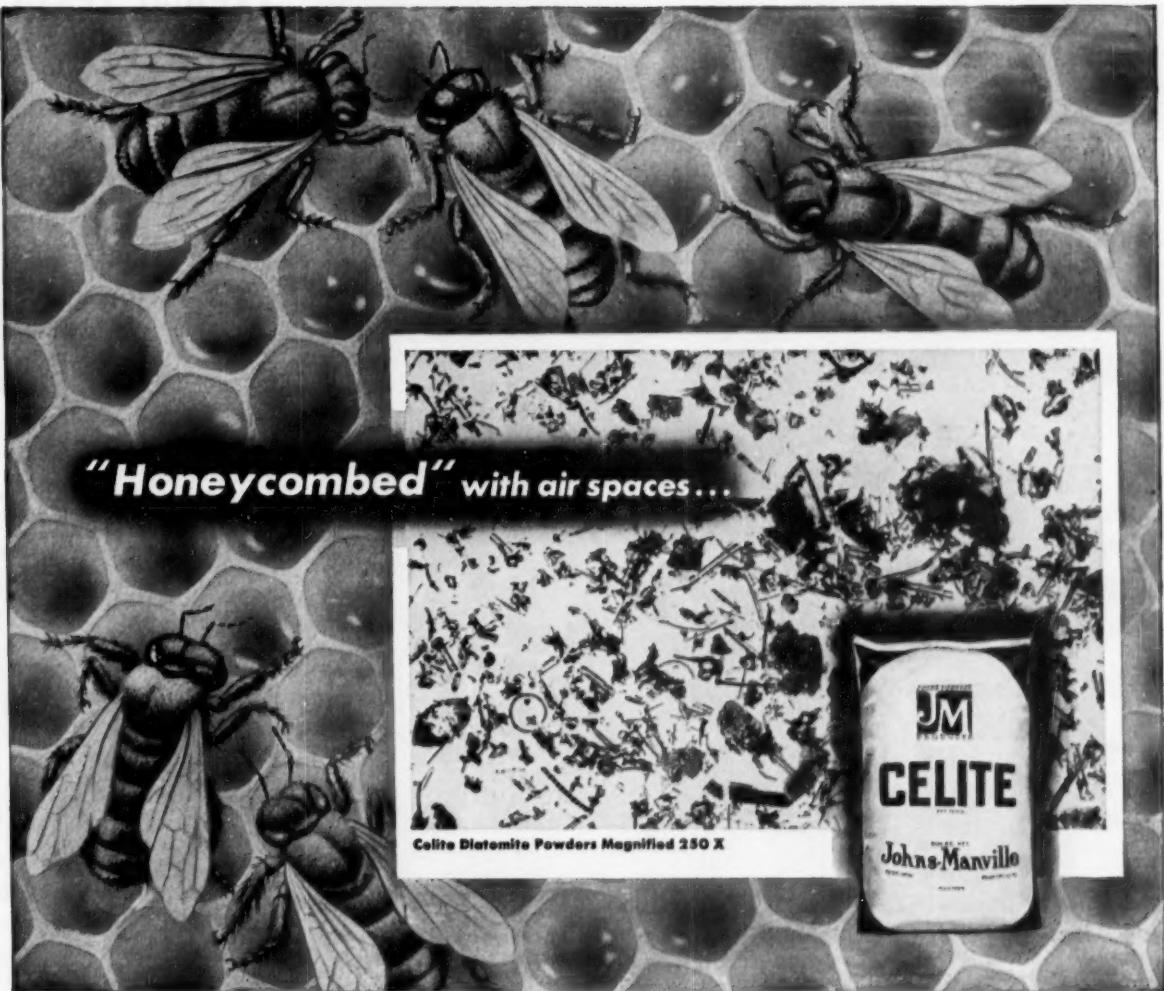
Moving into the pilot-plant stage is the man-made rubber developed by Goodrich-Gulf Chemicals as "chemically and physically a reproduction of tree rubber" (*CW Newsletter, Dec. 11, '54*). Company President William Burt says a pilot plant in northern Ohio will be in operation within a year, and that the output will be available to other companies for testing. Goodrich-Gulf recently reported that large truck tires made entirely of the new material are now giving satisfactory service in fleet operations.

United States trade with Russia and its European satellites appears this week to be rising more rapidly. During the first three months of the year, U.S. shipments to Russia jumped 29% over the comparable quarter a year ago; second-half shipments should be up about 35%. But the total, Commerce officials point out, still falls far short of pre-Korean trade levels.

Consulting its record-accomplishment sheet again this week, the official Russian mouthpiece *Izvestia* comes up with a fresh flood of figures.

Over the first six months of 1955, *Izvestia* says, Russian synthetic rubber producers increased output 9%, dyestuff makers pushed production up 14%, insecticide and herbicide producers managed to drive sales up 58%, and caustic soda and soda ash makers turned up production 12% and 9%, respectively.

Sulfuric acid and calcium carbide producers lagged behind, however, failed to meet government-decreed expansion goals.



Celite Powders provide bulking action 3 to 10 times greater than any other inert mineral filler

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*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.


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Processing easier, yields higher; all at no increase in price!

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TYPICAL TESTS



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BUSINESS & INDUSTRY . . .

Chemical Company Earnings

(1000 omitted)

	SALES			NET AFTER TAXES		
	1st. Half 1955	1st. Half 1954	% Change	1st. Half 1955	1st. Half 1954	% Change
Abbott Lab.	\$44,921	\$42,898	4.7	\$4,443	\$3,866	14.9
Air Reduction	71,192	59,926	18.8	5,170	3,219	60.6
Allied	318,181	271,756	17.1	26,523	22,694	16.9
American Potash	13,828	11,936	15.9	1,847	1,090	69.4
Atlas Powder	30,007	28,841	4.0	1,644	1,230	33.7
Commercial Solvents	24,956	23,769	5.0	1,572	1,290	21.9
Consolidated Chem. Ind.	17,531	15,236	15.1	2,130	1,884	13.1
Diamond Alkali	53,660	47,059	14.0	4,045	3,197	26.5
Dow*	248,645	215,557	15.3	20,862	16,661	25.2
Du Pont ⁽¹⁾	958,145	833,186	15.0	143,796	108,461	32.5
Eastman Kodak	315,850	278,132	13.6	36,365	28,134	29.2
Freeport Sulphur . . . . .	.....	.....	.....	5,870	4,774	23.0
Heyden	12,496	8,671	44.2	809	511	58.4
Liquid Carbonic ⁽²⁾	22,604	25,699	-12.1	1,363	1,049	29.9
Merck	77,124	73,678	4.7	7,327	6,335	15.6
Monsanto	207,514	169,715	22.2	16,410	11,598	41.4
National Lead	256,790	209,222	22.8	23,503	17,569	33.6
Olin Mathieson	270,800	244,167	10.9	19,941	18,550	7.5
Pennsalt	33,906	29,283	15.8	1,957	1,779	10.0
Chas. Pfizer	79,411	72,548	9.5	8,152	7,333	11.2
Pittsburgh Coke & Chem.	27,983	18,332	52.6	1,650	376	29.4
Smith, Kline & French	43,006	28,872	48.8	7,685	3,813	101.5
Schering	18,364	9,465	93.8	2,052	639	222.0
Sun Chemical	20,844	20,246	3.0	782	617	26.8
Texas Gulf Sulphur . . . . .	.....	.....	.....	16,939	15,515	9.2
Union Carbide	554,267	435,156	27.4	63,614	41,803	52.1
Victor	23,511	22,486	4.6	1,864	1,953	-4.6

^{*} Fiscal year ends May 31.

(1) Du Pont net after taxes does not include income from General Motors.

(2) Fiscal year ends September 30.

Earnings Spectacle: No Flash in the Pan

Chemical companies are so confident that both sales and net profits will shatter all existing records this year that their only question now is, "How big will the increase be?"

Basic reason: the industry is operating close to capacity; there's no indication that demand is even slackening.

Spectacular is the only word for sales and net profits over the first six months of 1955. Virtually every chemical company has turned in record gains (over a comparable period a year ago); most executives enthusiastically predict that the trend will continue upward—"well into 1956."

Not only is the average percentage

gain in sales (17.2%) the greatest since 1950, but net profits are also soaring—some 31% over 1954.

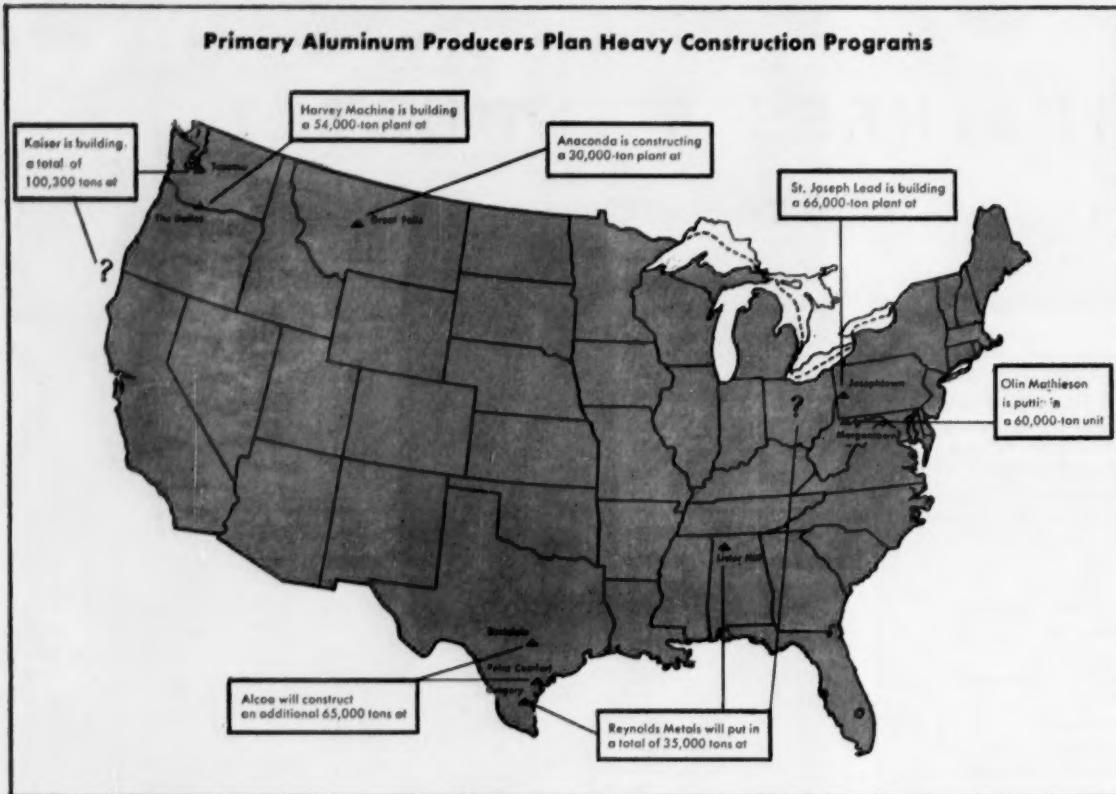
Major reason behind the recovery, executives admit, is that today most new plants — construction of which was spurred by the government's cold-war defense program—are in complete operation.

Also: taxes are lower; the industry as a whole hasn't been crippled by prolonged labor difficulties.

Diversification Pays Off: Those companies that scored the very highest gains—both sales- and profitwise—are notably the larger companies with the more diversified product lines.

But smaller firms, with fewer products, aren't doing badly either. Their average gain in sales was 12.4%—not far below the industry as a whole.

Another encouraging sign for the business outlook in the months ahead: U. S. shipment of chemicals overseas is on the upswing again.



Not to Be Denied

Irrked by the long delay in the Office of Defense Mobilization over the question of government-aided primary aluminum expansion, seven producers have decided to take the expansion plunge on their own.

Not only will their decision add a total of 510,300 tons/year of aluminum to U.S. production, but the move may serve as a spur to other basic-metal producers.

Here's how the aluminum expansion breakdown looks now:

- Reynolds Metals Co. has two expansion projects now under way at its Lister Hill, Ala., and Gregory (near Corpus Christi, Tex.) plants. These should be finished by late '56. The company is also determining a suitable location for a new 100,000-ton plant on the Ohio River in the Kentucky-OHIO-West Virginia area.

- Kaiser's Tacoma plant is undergoing a 5,300-ton expansion, is also looking for a suitable site for a new 95,000-ton plant.

- Aluminum Co. of America has

two construction projects under way at Point Comfort and Rockdale, Tex.

- Anaconda's first primary aluminum plant should be open in late summer, with a capacity of 30,000 tons. By early 1956, its plant capacity (at Great Falls, Mont.) should be doubled to 60,000 tons.

- Harvey Machine is working toward construction of a 54,000-ton plant near The Dalles, Ore. The question of a government-built power line is what's holding up construction.

- Olin Mathieson plans a 60,000-ton plant near Morgantown, W. Va.

- St. Joseph Lead now hopes to build a 66,000-ton plant at Josephtown, Pa.

- And Alcan, the big Canadian aluminum producer, promises to expand by 240,000 tons.

Now the second-most-used metal in the entire United States, aluminum-producing units have had to expand on the dead run since early 1955.

But the supply-demand market pinch in aluminum is repeated (to a

lesser extent) in other light metals, which supply processing industries, too.

Copper is in one of the tightest metal supply situations in many years. Industrial demand rose in 1955, just as copper was recovering from strikes in the U.S. during the summer of 1954. Then just last spring, Rhodesian and South African copper plants were struck, and government copper plants in Chile were closed.

Bogged Down Completely: The problem of would-be titanium producers is even more discouraging. Originally GSA set its sights on an expansion goal of 30,000 tons/year.

But the final contract (for 7,500 tons) between Du Pont and GSA has never been signed. And prospects of a helping hand to Imperial Chemical Industries, Ltd. (which has teamed up with Columbia-Southern Chemical Corp. to ask for a five-year, 5,000-ton contract with GSA) look far from promising.

Seemingly the best hope for metal producers today: to follow the example of aluminum makers — and "go it alone."



ARMSTRONG: His latest move, a warning to . . .

Fast-Buck Stock Sellers

In another step aimed at cracking down on fast-buck mining operators, the Securities and Exchange Commission last week ordered 12 Western mining companies to terminate all stock sales.

To enforce its order, SEC has suspended the firms' exemption from full registration and reporting requirements available on stock offerings which do not exceed \$300,000. While the exemption frees companies from making full disclosures, such issuers of stock must still file with SEC semiannual reports on the stock they have sold, and how they've used the proceeds.

The commission cites failure of all 12 firms to comply with the semi-annual reporting requirement and also to all requests for this information.

Adequate Warning: SEC Chairman J. Sinclair Armstrong has made a point recently of warning that, in too many cases, companies are taking advantage of the exemption available on stock issues amounting to less than \$300,000. They sell only enough stock to pay the expenses of underwriting, and then either fail to sell more (or don't try) and simply walk away with the proceeds.

Of the 12 companies suspended, four—to the best of SEC's knowledge—were incorporated to engage in uranium prospecting. The others include tungsten, silver, gold, copper and general mining operations.

Demand for Docility

Maidens, according to one old precept, should be mild and meek; and those same standards should apply to chemical products for consumer use, it's asserted in a new product liability lawsuit this week.

An Illinois youth, working on a farm, was told to spray with a certain pesticide, sodium chlorate. He did, but some spilled on his clothing, sustaining burns.

The youth and his father recovered between \$4,600 and \$4,700 under the state workmen's compensation act; but in addition, they've brought suit in New York against Oldbury Electro-Chemical, which had made the chlorate. Their complaint appears to call for sweeping changes in product liability principles; for example, a charge that Oldbury erred in distributing a chemical "too dangerous for the use intended." Oldbury says it will deny any negligence in manufacture.

Korea to Chemicals

General John E. Hull, who less than two years ago was solving knotty war-prisoner problems in Korea, will be the next president of the Manufacturing Chemists' Assn.

General Hull, who has served in the Army since 1917, became its vice-chief of staff in August 1951, assumed the Far Eastern Command in October 1953, and retired from active service last April 30.



HULL: Second full-time president of MCA takes office.



JUDGE MATTHEWS: For "left-wing" union, no short cut to justice.

Switch to Courts

Companies and unions alike are taking to courts of law this week to settle labor-management disputes that otherwise might be manifested as strikes tying up various segments of the chemical process industries.

Two cases involve strikes staged or threatened by the Oil, Chemical & Atomic Workers (CIO). In district and circuit courts, Lion Oil Co., division of Monsanto, has won decisions that OCAW does not have a right to strike during the life of its contract with Lion. This case—in which the National Labor Relations Board is backing the union's position—now has been appealed to the U. S. Supreme Court. In the other suit concerning OCAW, the Texas Co. is suing the union for \$74,226 for damages allegedly sustained by the company during a strike early this summer in Westville, N. J.

A case that may help to define the 1954 Communist Control Act has been decided in Washington by U. S. District Judge Burnita Matthews against the "left-wing" United Electrical Workers Union. UE had attacked the law as unconstitutional, but Judge Matthews threw out the case because the union had not yet exhausted administrative procedures.

Local 219, AFL Firemen & Oilers (AFL), is asking a court in Louisville, Ky., to enforce a job clause in its contract with Corhart Refractories.

BUSINESS & INDUSTRY

EXPANSION

Potash: United States Potash Co. will increase output at its Carlsbad, N. M., potash mine at a cost of \$3 million. Refining units will also be expanded, providing about 20% additional productive capacity.

It's expected that output from the expansion program will be available for the 1956-57 sales year, which starts June 1, 1956.

Hydrogen Peroxide: Becco Chemical Division, Food Machinery & Chemical Corp., has awarded contracts for construction work designed to lift capacity at its Vancouver, Wash., hydrogen peroxide plant by some 50%. Cost: \$1 million.

Pulp: Gulf States Paper Co. will build a multimillion-dollar pulp mill at Demopolis, Ala., with a capacity of 300 tons/day. Construction work will be completed by Christmas, 1956.

Sulfuric Acid: Consolidated Chemical Industries, Houston, Tex., has just placed two sludge-acid regeneration plants onstream at a cost of \$8 million.

These plants (located at Baytown and Houston) add 280,000 tons/year of regenerated sulfuric acid to the company's total output.

COMPANIES

Final approval for an 857,000-acre forest-management license for Celgar Development Co. (of British Columbia) has been granted by the B. C. provincial government.

The license will permit Celgar to proceed with construction of a \$30 million (300 ton/day) pulp mill at Caslegar in the Arrow Lakes region.

Celgar (a subsidiary of Canadian Chemical and Cellulose Co., Ltd.) originally requested a license for 1 million acres to build a \$65 million plant. Its demand, however, was drastically curtailed, due to the severe financial reverses that have beset the parent company since its incorporation in Canada four years ago.

Reynolds Metals Co. directors have proposed a five-for-one stock split, and reclassification of its shares from no par to \$1 par value.

Holders will also be asked to increase authorized common from 2.5

million shares to 12.5 million shares.

Hopes that Manitoba's lithium deposits (in the area northeast of Lac du Bonnet) will be developed received major encouragement last week.

Toronto interests (including the Mongul Mining Corp.) have acquired a controlling interest in Lithium Corp. of Canada, Ltd.—will insure sufficient funds enabling the company to undertake extensive drilling operations during the course of the next year and a half.

Lithium Corp., at present, holds 27 claims in the Cat Lake and Bernic Lake regions, is negotiating for 165 additional claims.

Recent company incorporations include:

• In Madison, Wis., Chapman Chemical Co. (an Illinois corporation), with capital stock of 50,000 shares of common, \$10 par value and

100,000 shares of preferred, also \$10 par value.

• In North Carolina, Goody's Manufacturing Corp. (to deal in pharmaceutical supplies), listing capital stock of \$400,000.

• In Tennessee, Mid-South Chemical Corp., listing capital stock of \$6 million.

• In Louisiana, Anthony Chemicals, Inc., listing capital stock of \$100,000.

• In Mississippi, Sta-Brite, Inc., listing capital of \$5,000.

• In Delaware, Natick Chemical Industries, Inc., listing capital stock at \$10,000 and Universal Lithium Corp., listing capital stock at 1,000 shares, no par value.

Zonite Products Corp. has purchased the ethical-pharmaceutical firm of Crookes Laboratories, Inc., Mineola, L. I.

The purchase was made for an undisclosed cash sum.



Face Lifting Over

BY THIS WEEK the metropolitan New York area's long-time landmark—Colgate-Palmolive Co.'s 80-ft. clock—is on duty again. Familiar to millions of N.Y.-N.J. commuters, the timepiece atop the firm's Jersey City plant had ticked away for

31 years. Now with much-needed modernization and adjustments completed, the world's largest timepiece (with a 19-ft. hour hand, 27-ft. minute hand) reclaims its title as Colgate's foremost goodwill symbol.

MATHIESON

ETHYLENE DIAMINE

Commercial quantities of high concentration ethylene diamine, $\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2$, are available from the Morgantown, West Virginia, plant. Shipments can be made in tank cars, tank trucks, returnable tin-lined drums.

For complete information, specifications, and samples, call or write today.

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for your information

brief summaries of
helpful product news



Here is a dramatic demonstration: At left, ordinary hydraulic fluid spraying into oxyacetylene torch burns explosively. At right, Pydraul does not!



Pydraul Fire-Resistant Hydraulic Fluid Gives Management Important Safety Tool

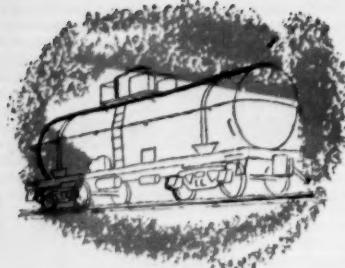
Wherever hydraulic lines are close to a source of ignition, ordinary flammable hydraulic fluid, escaping under pressure, can start a fire 40 ft. or more from a broken line.

A new 12-minute motion picture, "Before Hydraulic Fires Start," graphically demonstrates how Monsanto's Pydraul* F-9 fire-resistant hydraulic fluid can protect your plant and employees from costly hydraulic line fires. Although filmed in die-casting and steel plants, fire hazard conditions shown closely parallel those found in the chemical industry.

You will see tests proving that Pydraul F-9 outperforms other hydraulic fluids for lubricity, compressibility, pour point . . . how it prevents corrosion, oxidation . . . how its solvent action prevents build-up of sludge and impurities.

In addition to showing how easy it is to convert to Pydraul, the movie illustrates, step by step, how easily and economically Pydraul F-9 can be reclaimed and re-used to sharply reduce new fluid requirements.

This 16-mm. black-and-white sound movie is available for group presentation on request.



New Eastern Mersize Plant To Cut Delivery Time Up To 75%

Delivery time on Monsanto Mersize* fortified size to northeastern paper manufacturers will be reduced 50 to 75% when a new plant in Fieldsboro, N. J., begins operations in October.

It will be the first rosin distillation plant in the northeastern states . . . the second expansion in Mersize production during 1955.

In-transit time for tank car shipments will be reduced from the present 10-day average to four days or less, permitting east-coast papermakers to reduce Mersize inventories.

Shipments of Mersize will require less heating and unloading time because they will arrive at customers' plants while still warm.

Same-day delivery of hot Mersize to the area via tank truck will also be available.

Seeking Product Line Expansion? Consider Thenylpyramine

Monsanto Thenylpyramine fumarate and thenylpyramine hydrochloride are finding increasing use in pharmaceutical preparations where antihistaminic activity is desired.

Recent estimates predict that 20% of the growing multimillion-dollar over-the-counter market for non-habit-forming sedatives will be filled with products made from this.

For information, write Monsanto today.

Keep cooling systems free of slime and algae

In most recirculating industrial cooling water systems, serious fouling of water passages may result if slime deposits caused by growth of bacteria and algae are not checked.

Monsanto Santobrite,* sodium pentachlorophenate, technical, keeps cooling systems free of these slime-formers. It is noncorrosive to common metals, compatible with other chemical treatments given to cooling water, and is simple to use.

HB-40 is economical extender plasticizer

A low-cost, clear, mobile, high-boiling hydrocarbon, HB-40 is widely used as a secondary plasticizer in polyvinyl chloride formulations.

Now available in sufficient supply to meet expanding industry requirements, HB-40 is suggested for use as an extender plasticizer in plastics for slush moldings and coatings, in vinyl floor tile with special emphasis on asbestos-filled tile, and in filled extrusions, including those for SPT wire.

Check and mail the coupon for your copy of Technical Bulletin P-104.

Handy solubility tables featured in new Vanillin and Ethavan literature

The solubility of both Vanillin Monsanto and Ethavan* (Monsanto's ethyl protocatechuic aldehyde) in water, alcohol-water, glycerine-water and propylene glycol-water mixtures is now shown in table form in the two new-product folders just issued. This information will be of major interest to all seeking new ways to better the quality of baked goods, confections, flavors, candy, beverages, perfumes, pharmaceuticals, and soaps. For your copy of either or both of the informative folders, use the handy literature order coupon.



Sodium Benzoate: Low-cost insurance against food spoilage

Graphic evidence of sodium benzoate's role in preventing food spoilage is shown in this unretouched photograph of margarine.

In margarine, as in other perishable food products, including fruit juices, syrups, jams, jellies, etc., 1/10th of 1% of sodium benzoate offers low-cost insurance against bacterial action.

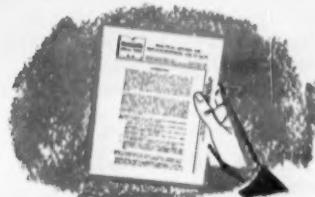
While today's efficient and streamlined methods of manufacturing and distribution have greatly reduced the incidence of spoilage, the addition of inexpensive, readily available sodium benzoate to perishable foods gives assured protection.

For more information, send for the leaflet: "Preserving with Sodium Benzoate."

*Reg. U. S. Pat. Off.

New bulletin describes analytical methods for Penta and its salts

A new technical bulletin, O-24, covering 10 years' research work on methods for detecting pentachlorophenol in treated products, has just been published by Monsanto.



Essentially a *laboratory manual*, the booklet gives detailed instructions for the detection of penta, its sodium salt, and certain closely related phenols.

This revised bulletin details six methods suitable for the detection of penta and also contains a section dealing with the preparation for analysis of such diverse materials as wood, asphalted felt, soybeans, cotton-seed meal, and many others.

The analytical methods presented represent a variety of techniques, one or more of which can be adapted to almost any laboratory facility. For your copy, just check the coupon and mail it to Monsanto.



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8/13/55

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 "Ethavan: Superior Flavoring Material" Penta Analytical Methods, Tech. Bul. O-24

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Company.....

Street.....

City..... Zone..... State.....

TAKING CRACKS AT 'MODEL CONTRACT'

What the collective bargaining groups don't like:

... the Company shall pay the Employee a salary that is mutually agreed upon from time to time at a salary review conference to be held at least once during each calendar year . . .

... The Employee shall devote substantially all his time, skill and best efforts to such duties as may be assigned to him . . .

... The Company shall receive the exclusive benefit from, and be the sole owner of, all inventions developed by the Employee in the course of his employment . . .

... employment shall continue until the Employee's retirement date under any applicable retirement plan, but may be terminated earlier either (a) by the Employee . . .

... It shall be the policy of the Company to encourage the professional development of the Employee, and so far as economically feasible, to provide the Employee with the opportunity to attend meetings . . .

... the Employee shall not at any time, either during his employment or thereafter, disclose to others, or publish, or take with him . . .

"No provisions for advancement in professional rank . . . Job descriptions and classifications are completely omitted."

"No mention of hours of work, holidays and vacations with pay, and whether overtime or compensatory timeoff is provided."

"Compensation should be paid to the employee upon assignment of invention rights to an employer."

"There should also be clauses covering such items as selection of employees for lay off when a work reduction is necessary and leaves of absence for sickness and other reasons."

"This clause fails to cover educational programs and subsidization of employee schooling and technical society dues."

"An employee must subject himself to brainwashing on changing positions!"

Touchy point for companies:

"It would be a bad idea if our head employee were to hurt a small company through endless arbitration and litigation."

... (in settlement of disputes) the cost of obtaining a decision by any of these methods will be borne by the Company . . .

Proposed for Professionals: Standard Pact

Even in the current era of conciliation—with peaceful parleys in Geneva instead of bitter recrimination between nations of the East and the West—it seems likely that chemical companies and their professional employees are near agreement on the kind of contracts that should be used for those chemists and engineers.

Every so often, a committee from one of the various professional organizations in the field will propose a "model contract" for this purpose; and up to now, each such proposal has been pigeonholed for silent suffocation. As of this week, it appears that a similar fate is in store for the latest offering along this line: a 15-clause model contract carrying the seal of approval of the American Institute of Chemists' national council.

This new plan still is a long way from the type of contracts favored by leading chemical companies, even though it incorporates a number of changes suggested by company executives who saw preliminary drafts. In addition, the AIC's model contract has drawn even heavier fire from some of the relatively new collective bargaining organizations for professional groups.

Equal Protection Sought: This model contract was drafted by a four-man subcommittee of the AIC's Committee on Employer-Employee Relations. The subcommittee was headed by Lloyd Hall, with Herman Bloch, Bernard Friedman and Helmuth Wegner (all of AIC's lively Chicago chapter) as members.

"Equality of protection" for both employers and employees was one of the prime considerations in putting the model contract together, Hall says. Also carefully considered: employment practice, termination of employment, inventions and development, benefits, and mutual obligations. The subcommittee placed "particular emphasis on equitable arbitration if arbitration is required and necessary."

"We feel," Hall explains, "that mutually acceptable contracts are one



FRIEDMAN, HALL, BLOCK: For smoother employer-employee relations.

phase of good human relations between the employer and the employee. It's our hope that this suggested contract, if utilized, will be of some value not only in protecting both the employer and the employee, but also in the improved relations between the two parties." Such a contract, AIC officers feel, would help convince chemists that they do not need a union to bargain for them.

Too Much Fine Print: In general, management seems to feel that the AIC model contract is too specific. Companies usually prefer to use one or more short contracts for scientific and engineering personnel, with detailed provisions only on patents and discoveries. Such a contract, it's held, gives the company ample leeway to reward deserving employees (not tied down to any salary schedule) and to juggle personnel into new lineups if the firm is forced to shift rapidly into new endeavors or to expand or contract its operations.

Among particular points in the AIC plan, one that would bother many management men is the clause requiring arbitration—at company expense—on all disagreements arising under the contract. This and the provision for enforcement of contract provisions through actions in equity could lead to interminable and costly wrangling with malcontent employees before arbitrators and judges.

Another specific clause would forbid

the employer to enter into "gentlemen's understandings" with other employers in the same locality or in the same branch of industry to ban proselytizing of each other's key employees.

Omissions Cited: But while employers figure that this proposed contract says too much, leaders of professionals' unions blast it for not saying more.

They think it should contain a list of job classifications with associated salary ranges as a blueprint for advancement; a clause outlining policy on promotions; the hours of work, and whether overtime or compensatory time off is to be provided; holidays and vacations with pay; and pension and group insurance programs.

"I fail to see," remarks Vice-President John Taft of Engineers & Scientists of America, "how such a document could give the chemist or chemical engineer any real protection, with the exception of some job security as spelled out in Section 8, coupled with the arbitration provision in Section 9." A parallel tack is taken by President Donald O'Connor of the Research & Engineering Professional Employees Assn.

With a gaping gulf between the positions of the employers and employees, it's a sure bet that this proposed contract will get nowhere in the industry—but that won't deter future committees from coming up with more model contracts.

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UNSPOKEN QUESTION AT GENEVA:

Will German Penetration
Of South American Chemical Industry
Continue to Rise?



Current Status: Watchful Waiting

Two main observations are possible concerning German post-war activities in South and Central America: there's no doubt that chemical makers in Chancellor Adenauer's Republic are eyeing the area eagerly; there's every indication that once political cobwebs are cleared away, the Germans will make their expansion move in earnest.

Oft-thought but seldom expressed question in the minds of chemical executives is what effect Germany's economic revival will have on U.S. chemical production in South America. Last month's "meeting at the summit" in Geneva emphasized military, political implications of reunification, failed to take up the economic problems involved.

But the simple fact remains—Germany is again poised on the brink of overseas expansion—an expansion that is sure to bear heavily on U.S. companies with investments abroad.

Surveying the extent to which that expansion has already taken root in South and Central America, CW correspondents agree that German chemcialization is so far "just a sample of things to come."

- In Brazil, the situation is perhaps the farthest advanced. All three major offshoots of the old IG Farben combine (Farbwerke Hoechst, Farbenfabriken Bayer, and Badische Anilin und Sodaefabrik) are again in chemical production, all plan construction of additional facilities in the near future.* Several other German companies are also eyeing possible industrialization, are awaiting October elections before making their move.

Prize package (and one the Germans are angling hard to nail down): control of petrochemical facilities to be built in connection with the government's Cubatao oil refinery, near Santos.

- In Bolivia (on a far less extensive scale) the Germans are also busy cementing overseas markets. Bayer owns and operates the country's major pharmaceuticals-producing plant; German exports (of acids, fertilizers, dyes, etc.) have been rapidly increasing in recent months.

* Fongra (operated by Hoechst, partly owned by W. R. Grace) expects to start construction of a \$5-million chlorine, caustic, solvents and DDT plant this year; Badische Anilin is currently turning out solvents, will move into production of dyes soon.

Firming Up: In a host of other countries (including Argentina, Mexico, Chile, and the Dominican Republic) German interest in chemical production is obvious, but to date unfulfilled.

- In Argentina, for example, 29 German-owned companies are today licensed to do business—21 of them are importers of basic chemicals and chemical by-products, and eight are importers of pharmaceuticals.

And just recently, Bayer revealed that it intends to get into the local manufacturing picture "with the support of Argentine capital." First on tap for construction: a plant to turn out Bayer-licensed azoic dyes; due to follow soon thereafter: a plant to produce synthetic phenol (at a rate of 1,800 tons/year).

This move, local businessmen predict, will launch a whole new flood of applications for incorporation of German-owned firms, could seriously affect U.S. exports into Argentina.

- In Mexico, the German industrialization picture is still sketchy, but equally bold.

The German Embassy currently is deeply involved in negotiations to retrieve patents (primarily pharmaceutical) that the Mexican Government confiscated during World War II. This, the Embassy points out, is a preliminary step to actual German production in the country, but one it is sure "can be successfully finalized within a matter of months."

Meanwhile, however, German manufacturers of chemical equipment are building (or have completed) three plants for local management; market research teams from several German companies have been touring Mexico, sizing up market potential.

Waiting an Opportunity: In Chile, where the economic situation has gone from bad to worse during the past few years, the Germans are quite frankly waiting on the sidelines.

With an ever-increasing foreign exchange deficit, and galloping inflation, Chile is hardly the ideal spot for foreign investment today.

But after Bonn Minister of Economics (Ludwig Erhard) visited in Santiago during the course of the past year, several German firms (including Otto Wolff A.G., Cologne, and Phrix Werke A.G., Hamburg) evinced interest in establishing cellulose-producing units in Chile, are currently involved as deep as the blueprint stage.

- In the Dominican Republic, the only German company officially in operation today is South P.R. Sugar Co.—processing sugar cane bagasse for export. But here, too, the Germans have recently been observed paying courtesy calls, charting market potential.

Still Untapped: The bulk of the other companies in South and Central America are, as yet, uninhabited by post-war German industrialization. But it's only, as one local manufacturer puts it, "a matter of time."

- In Colombia, for example, there is no such thing as a basic-chemicals industry—either fully owned German plants or facilities built with German capital. But several German companies (mainly pharmaceutical makers) have approached the government concerning registration requirements—"to get the lay of the land."

- In Peru, visits of German industrialists recently stirred up talk of possible chemical investment, but there no concrete moves have been made.

- In Central America (notably in Costa Rica and Nicaragua), current chemical producing plants are still firmly tied up with U.S. companies. But recently Dutch interests (for the first time) have tentatively offered to set up a fertilizer and insecticide plant in Costa Rica; observers notice, with interest, that the Dutch representatives were talking in terms of a "partnership" in their proposals.

Such being the case, there's little reason to question why U.S. chemical companies are perturbed over the business outlook. Long aware of the tenacity of German industrialists, they're convinced that this is only a sample of things to come.



PRESIDENT MORGAN: scans world outlets while . . .
... Vice-President Sheehy (above right) looks for broader bases
and sales manager Brown defends pricing policies.



Triple Track to Growth

Expansion fever has smitten Rayonier Inc. (New York).

Within coming months the giant chemical cellulose firm* plans (1) to extend silvichemical production through construction of an additional \$1-million, 25 ton/day production unit at Port Alice, B.C.; (2) to build a 32,000 sq.-ft. Eastern research and development division at Whippny, N.J.; and (3) to set up a 100,000 ton/year chemical cellulose plant "somewhere in the Southeast."

It's all part of Rayonier President Clyde Morgan's planned strategy to keep a strong hand on the U.S. chemical cellulose picture, while bearing down on overseas consumer targets.

"I can't resist the temptation to stress again that export markets are today of ever-increasing importance to Rayonier," states Morgan.

That's no empty statement either, because so far this year close to 40% of Rayonier's sales (equivalent to 146,520 tons of cellulose) has gone abroad. By 1957, when company cellulose capacity reaches a planned 900,000 tons annually, that percentage figure could be substantially hiked.

*Now operates five plants in the U.S., two in Canada.

Broadening the Base: While the prime stress at Rayonier in coming months will be bent on attracting foreign customers, that won't be the only emphasis. James Sheehy, company executive vice-president, is counting on "greater utilization of tree chemicals" to broaden the company's chemical base.

Sheehy is shooting for silvichemicals to become to the chemical cellulose industry what petrochemicals are to petroleum. Right now, Rayonier's big silvichemical outlet is "Rayflo," a drilling mud dispersant to replace imported quebracho bark (a 15,000 tons/year market). Says Sheehy, "In about 12 months our silvichemical capacity will be 9,500 tons/year, but we're counting on adding another 7,500-ton production unit soon thereafter to bolster our drive for diversification."

But even now Rayonier's interests are spreading. Whereas formerly the company was geared only to supply an infant rayon industry, now 41% of its cellulose output goes into textile making, 25% ends up in paper and pulp, 15% is taken by tire cord manufacturers, 11% goes into cellophane manufacture, and 8% finds other chemical uses.

And rumors persist, too, that before fall Rayonier will unwrap (with Chemical Process Co.) a new anion-exchange resin for making a variety of new compounds from waste sulfite liquor fractionation.

Rumblings Abroad: To date Rayonier's expansion future seems rosy indeed. That picture may not continue unspoiled, however.

Reason: in stressing (to foreign users of chemical cellulose) its "realistic pricing policy"** (devoid of whipping saw fluctuations based on world supply and demand)—Rayonier may be incurring the enmity of various powerful forces overseas.

Prime among these forces are world cellulose cartels (in Scandinavia, Germany, and Austria, for example). Right now, such combines are pressuring Rayonier to abandon its international pricing tactics for policies more in line with European marketers.

So far, general sales manager Michael

**Based on actual production and labor costs with no "favored nation" influence.

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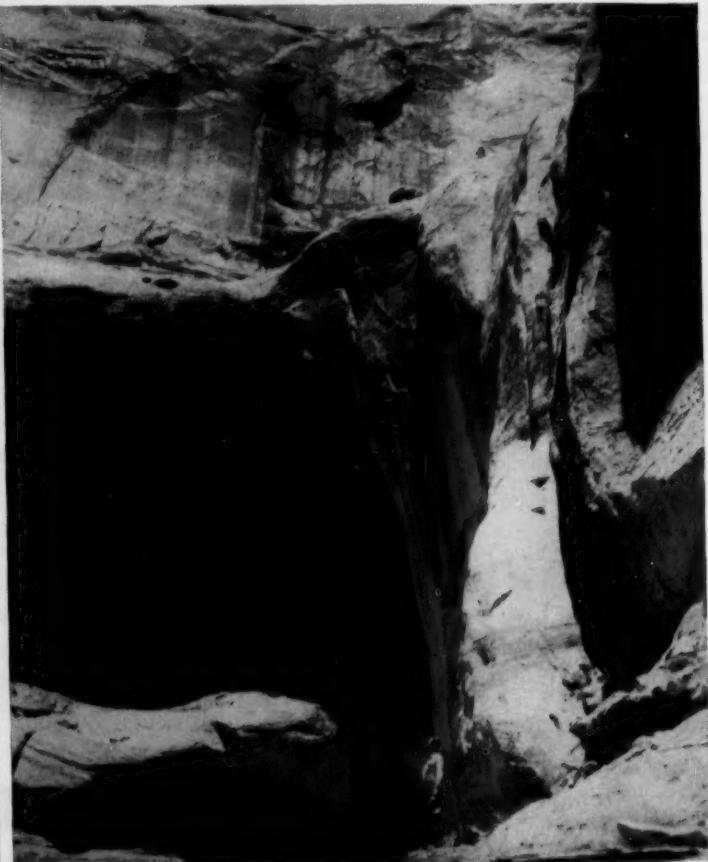
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Brown has ignored all pressures—to Rayonier's advantage. But the situation could change at a moment's notice despite all the company's studied efforts.

Solid Backing: In defending his highly controversial pricing stand, however, sales manager Brown has President Morgan's solid backing. Referring to Rayonier's recent scheduling of its annual board meeting in Paris, Morgan says, "Our directors went to

Europe primarily to reassure foreign users that we would be able to take care of their future cellulose requirements at prices they deemed would be fair."

With such willingness to go all out to put their point across, it's not unlikely that Rayonier executives will succeed in their avowed intentions—or that the company will continue to carve a larger niche for itself in world cellulose production.



Intriguing but Awesome

DESPITE ATOMIC ENERGY Commission reports that domestic uranium production is today at record levels, the hunt goes on for untapped sources of uranium-bearing ore. Here Earl Thompson, helicopter pilot, is dwarfed by a cave in south-central Utah.

Chance that the individual prospector will make a million, how-

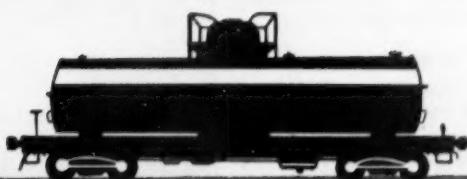
ever, is much slimmer than the chance he will end up broke.

As one uranium mining expert frankly admits, there's need for the amateur prospector, but warns that he should have some knowledge of geology and mineralogy, \$10,000 to live on for a year, and \$50,000 to dig out the ore once he locates it.

3
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PHOTO: CHRIS GRUBE, MC GRAW-HILL

FOR SHARPER BARGAINING: In area schools, chemical union teaches . . .

Today's Tactics for Coveted Contracts

"We should provide in peace what we need in war," counseled a Roman sage nearly 2,000 years ago; and numerous chemical companies are coming to see that his advice has been taken to heart by the International Chemical Workers Union (AFL). This union puts considerable stock in its regional week-long summer schools that take chemical plant workers and coach them on strategy to be used—including strikes if necessary—in bargaining for bigger and better contracts when renegotiation season comes.

Of course, numerous chemical companies—aiming to be prepared for ever

more skillful bargaining on the part of their plant workers—have been taking similar measures by sending specialists to industrial relations conferences such as those sponsored by the American Management Assn. (next AMA personnel conference: Sept. 26-28, New York).

How-to-Do-It Courses: This summer, ICWU's Research & Education Dept. has conducted schools at Lake Junaluska, N.C.; Lake Cachacoma, Ont.; Monticello, Ill.; and New Brunswick, N.J. The union's International Executive Board set up a \$3,000 scholarship fund to pay tuition for se-



PRIMED FOR PARLEYS: After week's studies, student gets ICWU diploma.

lected members, and each local union was invited to send as many additional members as it could afford to pay tuition for. Attendance ranges up to 70, and instructors include outside lecturers as well as ICWU staffers.

A strong how-to-do-it flavor pervades the subject matter. Typical topics: wage trends and the guaranteed annual wage, goals on fringe benefits, seniority rules, civil rights, AFL-CIO unity, issues before Congress in which the union takes an interest, and currently favored tactics for getting desired contract clauses.

Classes are informal, student participation is encouraged, and lectures frequently are interrupted for a discussion of some particular problem recently encountered.

Broader Insurance Coverage Sought: In their classes on what to ask for and how to argue in support of those demands, ICWU instructors strive to foresee and counter the companies' reasons for opposing those demands. On the subject of higher wages, for example, students are advised on when and how to use such arguments as increased productivity, ability to pay, lag behind prevailing rates in the community or in the industry, and need for higher pay to meet increased costs of living.

One subject that's getting special emphasis in ICWU schools this year: health and accident insurance. Students are being advised to go back to their local unions and agitate for comprehensive insurance programs that will cover substantially all medical, surgical and hospital expenses for plant workers and members of their families. They're being told that a good health plan should include both preventive and treatment services, in doctors' offices, homes, health centers and hospitals. Teaching on this subject comes from the Committee for the Nation's Health, Washington, D.C., a group that favors federal legislation to establish a nation wide health plan that would include national health insurance.

Students aren't being told to rush back and fight for GAW or layoff pay plans, but they're being given an analysis of the Ford and General Motors "supplementary unemployment compensation" agreements that suggests that GAW is well worth talking about when it's time to renew contracts with chemical concerns.



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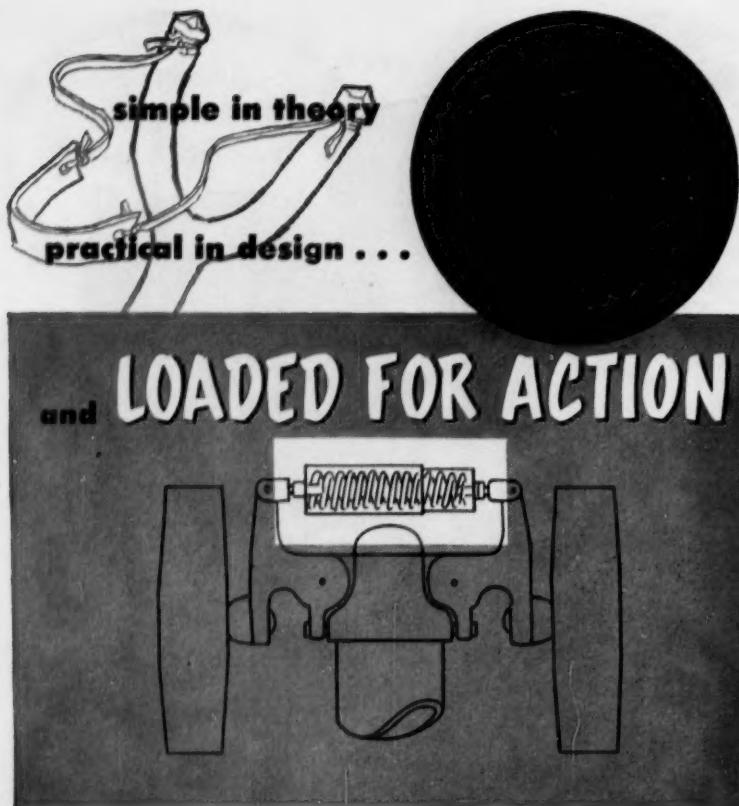


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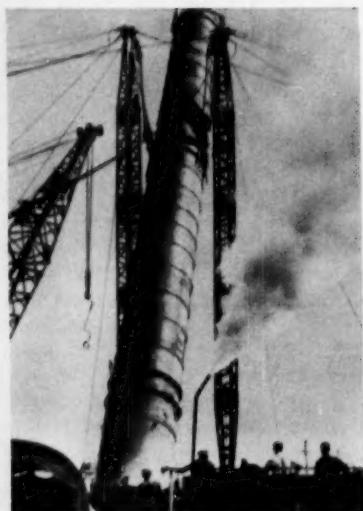


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B & I.



FORTH CHEMICALS: Doubling styrene production at Grangemouth.

FOREIGN.

Styrene/Great Britain: Forth Chemicals, formed in 1950 by British Petroleum Chemicals, and Monsanto Chemical Co. (St. Louis), has embarked on an expansion program planned to double styrene production at Grangemouth, Scotland. The 140-ft. distillation tower (*above*) weighs over 85 tons.

Petrochemicals/Japan: Japan's infant petroleum industry is going to get a lift soon—where it needs it most.

The Japanese government realizes that if it is to compete in world petrochemical production, it must have a greater supply of raw materials to turn out benzol, acetone, and phenol. Therefore the government will:

- Provide financing from the Development Bank.
- Allocate foreign currency to allow for importation of necessary equipment.
- Exempt petrochemical producers from corporation taxes.

All three moves are designed to induce construction of petrochemical producing facilities.

Soap Products/Mexico: Caught in the squeeze between rising production costs and Mexican government ceiling prices, Procter & Gamble's wholly owned Mexican subsidiary has suspended expansion plans amounting to more than \$1 million.

P&G already has a \$5-million invest-

ment in soap and detergent producing facilities in Mexico, feels that under present circumstances it is not getting enough return on its money to warrant additional investment south of the border now.

Detergent Intermediates/France: With an eye to the increasing demand for synthetic detergents in Europe, a group of French petroleum and chemical companies have banded together with Oronite Chemical Co. to produce and sell dodecylbenzene in France.

The French companies (Compagnie Francaise de Raffinage, Antar-Petroles d'Atlantique, Progil, and Societe d'Electro-Chimie d'Ugine) have also decided to expand their produc-

tion of propylene tetramer—used in making dodecylbenzene.

The Franco-American group will found a new company (Societe Petro-synthese) to handle construction, production chores. Initial capitalization: \$1.4 million; production capacity (of dodecylbenzene): 26,400 tons/year—enough to supply the entire current European market.

Paints/Colombia: Sherwin-Williams will license manufacture of all its products to a Colombian company called Sherwin-Williams de Colombia.

The newly-formed Colombian firm will immediately take steps to build—with exclusively Colombian capital—a paint-producing plant in Bogota.



Start on Stockpiling

FIRST SHIPMENT of lepidolite lithium ore from Bikita, Southern Rhodesia (Africa), has arrived at Corpus Christi for stockpiling by American Lithium Chemicals, Inc., at San Antonio, Tex.

Here, samples are inspected by Howard Leatart (right), traffic man-

ager for American Potash & Chemical Corp., parent company of American Lithium Chemicals.

At last reckoning, construction work on American Lithium's new plant is proceeding according to schedule; completion is expected before the end of the year.

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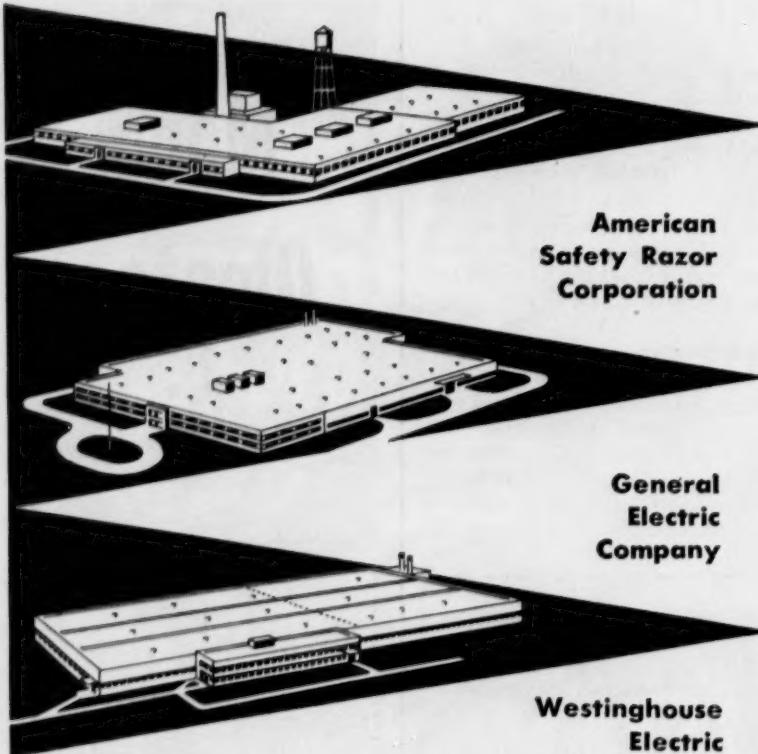
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B & I.

LABOR

Higher Employer Levy: Revision of Pennsylvania's laws on workmen's compensation and occupational disease—now pending in the state senate—would mean an estimated 30% increase in cost to Keystone-state employers. The amendments, says Gov. George Leader, would "place Pennsylvania's law among the best 10 in the U.S." Maximum benefits would be raised \$5 to \$37.50/week.

Merck Locals to be Allies: Another step is being taken in the program being undertaken by the Oil, Chemical & Atomic Workers (CIO) to set up companywide and industrywide councils for coordinated bargaining.



OCAW'S APPELBAUM: In move for coordinated bargaining, one more step.

Latest step in this move—which is being handled by OCAW Vice-President Joseph Applebaum—calls for representatives of three OCAW locals at Merck plants to meet Sept. 11 in Philadelphia to form a companywide bargaining council.

Bigger Wage Boosts: In the wake of the new contracts in the auto industry this summer, wage increases have been coming in larger sizes. Aluminum Co. of America is granting an 11½¢/hour across-the-board increase plus 3½¢ between job classifications, and two big copper producers—Anaconda and Phelps-Dodge—have settled with the Mine, Mill & Smelter Workers

for pay hikes ranging from 11½¢ to 17½¢/hour. Principal new agreement in the chemical industry during the past fortnight was the two-year pact between Monsanto and the CIO Electrical Workers covering about 1,900 employees at Springfield, Mass. It provides for a 10¢ wage rise now and an additional 6¢ next July.

Strikes Still Seething: The industry is still beset with labor troubles, with production and maintenance workers on strike in the East and South.

- Rounding out their second month on picket lines are members of the Oil, Chemical & Atomic Workers (CIO) employed at Heyden's pentaerythritol plant at Garfield, N. J.

- A possible break came in the two-month-old phosphate strike in Florida when International Minerals & Chemical raised its offer to about 8¢/hour, retroactive to May 15.

- Hopes for a settlement also were rising in Barberton, Ohio, where members of the independent Allied Chemical Workers have been on strike for more than a month against Columbia-Southern Company and union officials were attending new talks in Cleveland, with federal mediators sitting in.

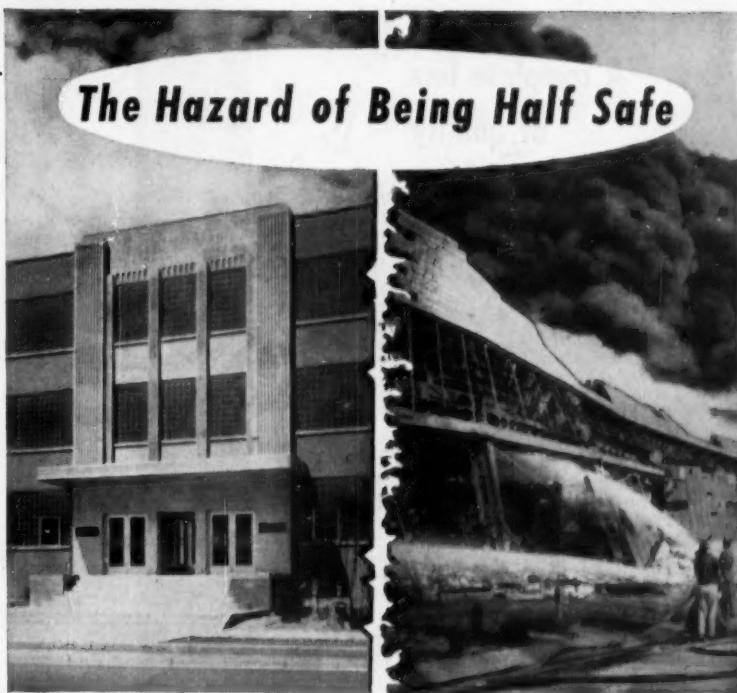
- In Binghamton, N. Y., where some 275 OCAW members have been striking for about a month against National Gypsum, about 370 members of the AFL Machinists walked out in a dispute over new contract terms.

Notice of Parting

Du Pont and Olin Mathieson have taken formal steps necessary to get Securities and Exchange Commission approval of a transaction by means of which Du Pont will surrender its 49% interest in Equitable Power Manufacturing Co.

Du Pont will give up its stock in the jointly owned firm, which makes and sells dynamite, blasting caps, and highway safety signals, for an aggregate amount in cash and securities estimated at over \$4.6 million, will leave Olin as sole stockholder.

Reason for Approval: SEC approval of the partial liquidation is necessary under the 1940 Investment Company Act, since Equitable is an "affiliated person" of registered investment companies (Christiana Securities Co. and Delaware Realty and Investment Co., which in turn control Du Pont).



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B & I.



WIDE WORLD
MAYOR OLGIATI: In Chattanooga, a request to close a chemical plant.

L E G A L

Plea for Moving: Mayor P. R. Olgiati, of Chattanooga, this week is facing the task of making a decision. The chairman of the city's Air Pollution Board has recommended that Tennessee Products & Chemical Corp. be asked to pick up its ferromanganese plant on Chestnut Street and move to a new and more isolated location. Company President Carl McFarlin, Sr., has offered to install newly devised pollution control equipment, but would like the city commission to enact an ordinance that would state precisely how much of each contaminant is allowable for local industries.

Proxy Contests: A high state court has propounded a basis for determining whether a corporation management can charge to the company the expenses it incurs in a proxy fight. New York's court of appeals says that this can be done if management is fighting "for policies which the directors believe, in all good faith, are in the best interests of the corporation." However, the court goes on to say, stockholders do not have to pay for a proxy fight that is promulgated "for personal power, individual gain, or private advantage."

Products Mislabeled: Five chemical and drug products have drawn the wrath of the U.S. Food & Drug Administration in court actions completed recently. Two shipments of coal-tar

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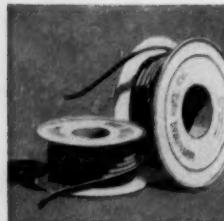
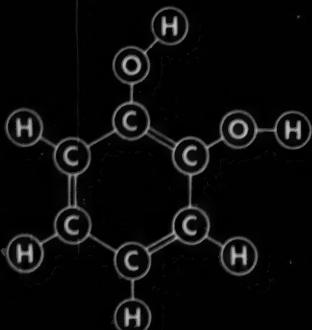
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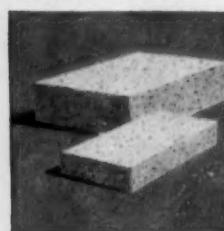
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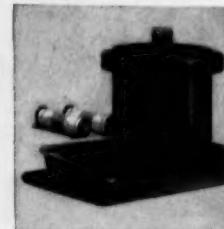
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In fur dyeing



In antiseptics, analgesics, astringents



As a photographic developer

Catechol is a water-soluble, crystalline, dihydric phenol. Its chemical reactions include those typical of phenols, such as alkylation, bromination, oxidation, and etherification.

A recent application of Koppers Catechol is in the vulcanization of certain elastomers, especially in the forming of froth sponge. It has also found increasing use in the electrotinining of copper wire.

In fur dyeing, Catechol aids in producing a brown oxazine dye of excellent color quality and fastness. The versatile chemical is also used as a

photographic developer, particularly in fine grain development formulations, and in medicinal solutions such as antiseptics, analgesics and astringents.

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Koppers Chemicals

B & I.

colors were seized because they had not been certified for food use. A caustic-soda stove cleaner and a hydrochloric-acid radiator cleaner were confiscated for failing to bear proper warning labels, as required by the Caustic Poison Act. And the makers and distributors of C-Tone, a vitamin product, were prosecuted for claiming various therapeutic uses for C-Tone.

KEY CHANGES . . .

Wallace E. Cake, to vice-president, director, and executive committee member, U. S. Rubber Co. (New York).

Henry A. Thouron, to general manager, Synthetics Dept., Hercules Powder Co. (Wilmington, Del.).

George Van Gorder, to president and board chairman, McKesson & Robbins Inc. (New York).

George L. Innes, to manager, chemical sales, Climax Molybdenum Co. (New York).

Raymond B. Seymour, to president, and **Harry Millerburg**, to board chairman, Loven Chemical Co. (Newhall, Calif.).

W. H. Stark, to director, executive vice-president, and general manager, Standard Ultramarine & Color Co. (Huntington, W. Va.).

William B. Porterfield, Jr., to vice-president and sales manager, National Potash Co. (New York).

Horace A. Gray, Jr., **George Champion**, **Edward Bartsch**, and **Ruppert T. Zickl**, to directors, Virginia-Carolina Chemical Corp. (Richmond, Va.).

C W Report

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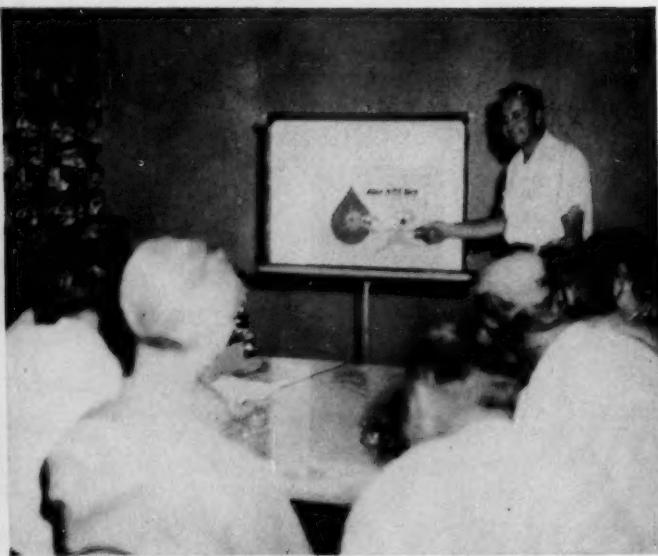
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IN CANADA: Standard Chemical Limited
and its Commercial Chemicals Division

DISTRIBUTION



SALES PRIMING: First-day luncheon chat by President Reed disposes dealers toward how-to-sell films, lectures and . . .

Aqua Ammonia: Trickle to Torrent

Any day now, Brea Chemical (subsidiary of Union Oil Co.) will twist valves to "on" in its new, 50,000 tons/year prilled ammonium nitrate plant at Wilmington, Calif., start 10,000 tons/year of 20% and 40% aqueous solutions pouring out. And, it's bringing anhydrous ammonia production up to 100,000 tons/year, has basic facilities for another 50,000 tons/year now in place.

Significance—plenty of it—abounds in every gallon flowing through the pipes: viz., it's a dollar-and-cents expression of confidence by Brea that aqua ammonia is here to stay; that crucial sales problems are all but licked. The additional aqua is also evidence that a newcomer (CW, Aug. 14, '54, p. 52) can still buck established giants if it knows its distribution.

That aqua ammonia has arrived is shown clearly by these figures for California fertilizer sales (in tons):

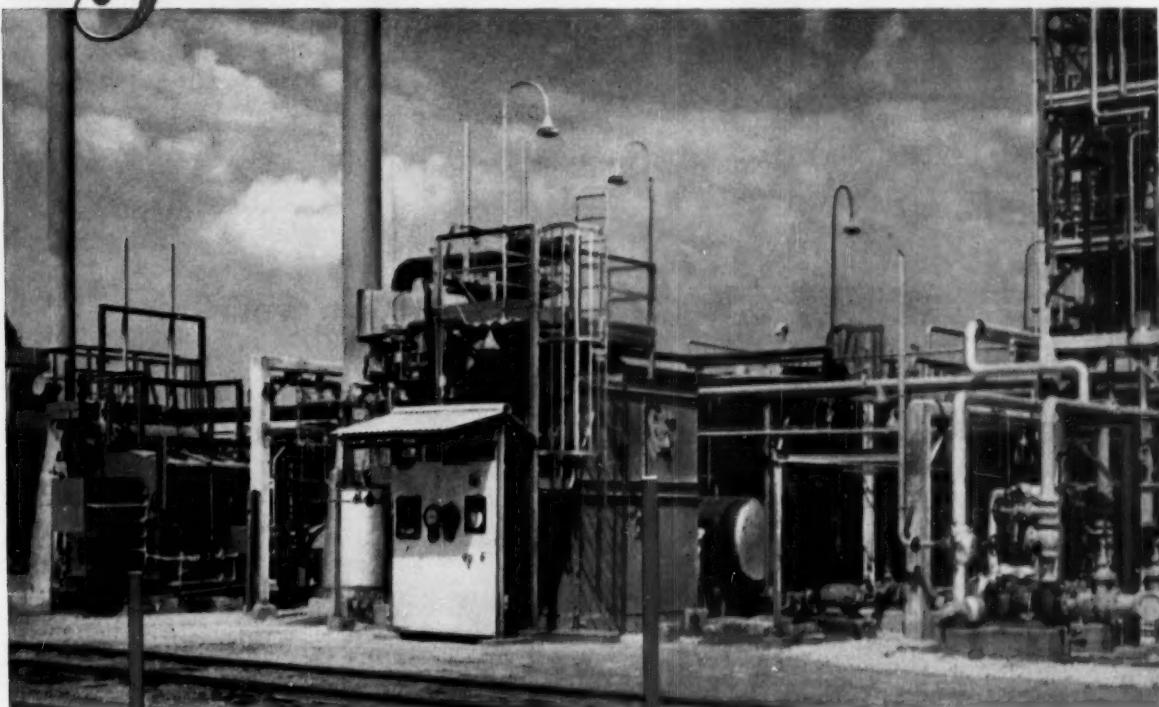
	Anhyd.*	Aqua
1955 First quarter	11,060	29,831
1954 First-half	30,000	58,563
Total	51,000	103,755
1953 First-half	27,000	17,818
Total	46,000	35,694

*Multiply by 4 to obtain nitrogen equivalent on an aqua basis. Anhydrous figures, except for 1955, are estimates. This year, California began reporting fertilizer sales.



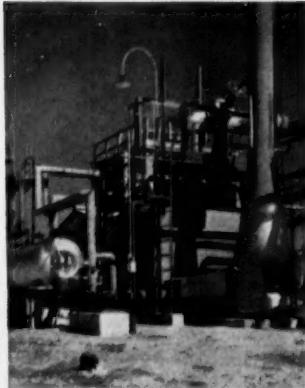
. . . the know-how needed to operate portable aqua ammonia storage tanks.

at Jefferson Chemical Company's Naches Plant



FW 3,700,000 BTU DOWTHERM UNIT

This 2,300,000 btu Dowtherm unit by Foster Wheeler served the original ethylene oxide-glycol unit at Naches. After this was expanded, the 3,700,000 btu unit went on line, and the smaller Dowtherm vaporizer was removed and installed at Jefferson's Austin Laboratories as shown in the photo below.



puts the heat on

Ethylene Oxide—Ethylene Glycol Production

Here, at the Naches plant of the Jefferson Chemical Company, large amounts of heat, at closely controlled temperatures, are required for the quality and quantity production of ethylene oxide and ethylene glycol.

All high-temperature, low-pressure heating requirements at this Jefferson plant are supplied by the 3,700,000 btu Dowtherm unit shown above — designed, built and installed by Foster Wheeler.

Wherever you need industrial or process heating, with pinpoint temperature control in the 350F to 700F range, low-pressure Dowtherm systems by FW offer many important advantages. And only FW does the *complete job* — from design and installation to operation and servicing. For information on Dowtherm installations, send for your copy of Bulletin ID-54-5, *Foster Wheeler Corporation, 165 Broadway, New York 6, N.Y.*

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DISTRIBUTION



DEALER COUNSELING: What's good for the distributor is good for Brea.



RADIO SERVICE CRUISER: Answered farm questions win farmer friends and sales.

Building aqua sales from 36,000 to 120,000 tons/year in three years wasn't easy. Challenges lurked at every step. Now, obstacles cleared, Brea officials have revealed to CW just how aqua fertilizer was launched, aided by a first-rate dealer chain.

Decision for aqua over anhydrous demanded balancing the risks against the potential gains. Key problems:

- Organizing a new firm with top executives (mainly oil men) not well versed in fertilizer operations.
- Marketing against big competitors.
- Establishing a dealer network.
- Pioneering a new, yet-unaccepted form of product.

Key assets, on the other hand:

- Supply source. Parent firm, Union Oil, the raw material source, assured dependable supply.
- Big market potential, proved by elaborate research.
- Easy convertibility of Union Oil tankers and tank farms to aqua storage. Storage costs for three months' plant output in oil tanks: \$100,000; for equivalent anhydrous: \$400,000.
- Strong selling points (relative safety of low-pressure application) that appeal to the do-it-yourselfer.
- Adaptability of aqueous ammonia to the trend toward solution fertilizers (mixes readily with other additives).

With this imposing array countering its problems, Brea voted for aqua.

Story begins on page 38

Simultaneously, it bet on a vigorous dealer chain to do the hard selling. Getting dealers, curiously enough, was easy. When word leaked out, 164 came pounding on the door. The chosen few (30 major, many smaller) were financially stable, well known, well versed in their own territories, and willing to invest \$20-\$60 per annual ton of sales for equipment.

From the comprehensive market research program, Brea defined dealer territories, then gave distributors the tools to do the job. The implements: a meaty six-phase program. Phases:

- Elimination of dealer storage problems through the company's 24-million-gallon, 13-terminal system.
- Development of special application equipment to support key sales pitch —viz., precise quantities at precise spots.
- Location of agricultural technicians and equipment servicemen alongside the dealers, but terminal-centered.
- Dealer training. Easily the heart of the plan, it has ranged from initial two-day sessions (covering all essential background and marketing problems unique to each dealer's area) to aid in setting up the dealers' books. Now, the firm is running eight, hour-and-a-half training sessions for dealer salesmen replete with films, sales techniques, technical data, etc. And, there's a steady stream of updating equipment and product bulletins.
- Installation of a cooperative advertising program. Here, Brea plans ads, supplies materials, shares local promotion costs, runs local market research and offers advice to dealers on sales, business, and financial problems. Add too, Brea's own campaign.
- Product diversification—i.e., aid for the dealer in getting into phosphate and sulfate solutions. "Distinct competitive advantage" for the dealer, says Brea.

That this program has paid off seems well established. But whether Brea can hold all its newly won gains is moot. Anhydrous ammonia makers can be expected to storm back. Too, there's nothing to stop them, either, from converting anhydrous to aqua—a relatively simple job. Come what may, however, Brea has added impressive evidence to the thesis that smart distribution—and a new product form to fill a need—is one way to break into business.



ANOTHER BIG ORDER

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And, thanks to many advances made in the manufacture of Rheem Fibre Drums, they are the ideal containers for many products which formerly required far more costly packaging methods.

For complete information on how Rheem Fibre Drums can save you time and money, write today to the Rheem office nearest you.

Did you know these facts about Rheem Fibre Drums?

1. They can be colorfully decorated, at low cost, through the silk screen process. Or, if you wish, labels may be used.
2. Special interior linings can be applied to give the proper chemical protection to a wide variety of products requiring it.
3. Special laminates can be built into the drum walls to provide an added moisture barrier without adding greatly to the cost.
4. The light weight of sturdy, durable, economical Rheem Fibre Drums reduces shipping costs. Empty drums can be nested to save space.

Switch in time, Switch to



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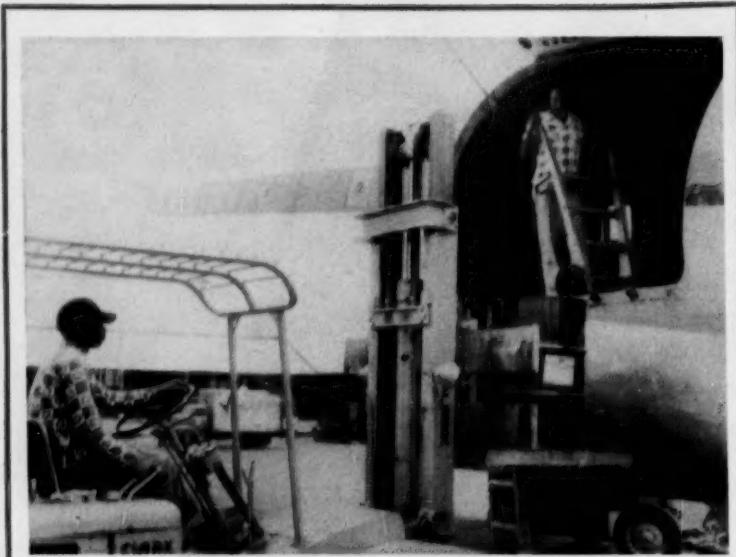


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DISTRIBUTION



Speed Saves the Barley

Twentieth-century transportation and superspeed order-processing merged forces recently to save hundreds of Canadian farmers from millions of dollars' worth of crop losses. Corn-leaf aphids — trillions strong and barley hungry — were making straight for 7.5 million acres of golden-green barley.

Supplies of the insecticide soon began to give out. American Cyanamid, sole manufacturer of the effective remedy, malathion, was half a continent away—weeks by freight.

A long-distance phone call put sales and traffic departments at

Cyanamid into "rush" gear. Traffic hunted down air cargo space and by the next day, the first 5½-ton plane load (*above*) was in flight.

At Winnipeg, 'round-the-clock work by Canadian Industries, Ltd. (distributor) and Chipman Chemicals (CIL's formulator) speeded air shipments through customs, plant, and the field distribution operation. Within a week, 33 tons of flown-in malathion was applied.

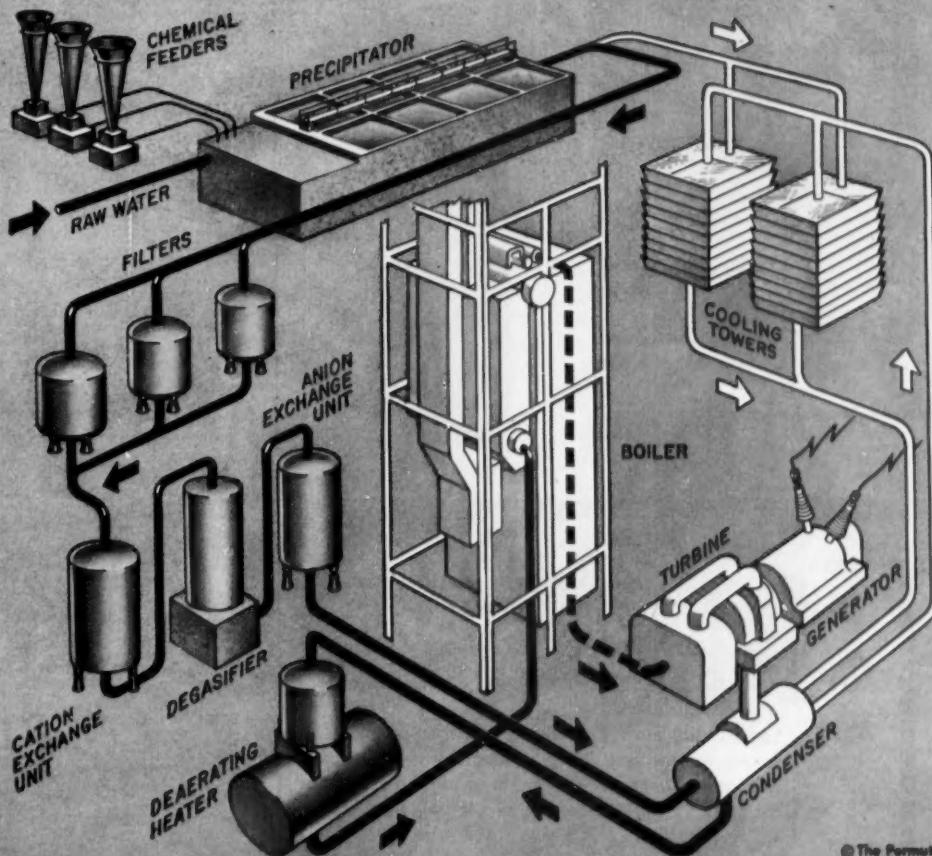
The quick marshaling of forces rescued most of the crop. In Saskatchewan alone, that's a 2-million-acre, \$50/acre accomplishment.



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Modern power plants require "ultra-pure" water for their high-pressure boilers. To provide it . . . new equipment produces the equivalent of commercially distilled water . . . at far lower cost!

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Ordinary water with just the dirt and hardness removed was good enough for old-time boilers. But today's efficient plants operate at high steam pressures . . . up to 2600 psi. Future plants will operate at 5000 psi. and up!

- At high pressures **any** mineral element in the water causes trouble. For example: The few parts per million of dissolved silica in practically all water, while harmless for drinking, builds up as a glass-like deposit on turbine blades . . . impairs the balance and efficiency of the turbine.

- Simplified flow sheet shows how a muddy river water might be conditioned: The Precipitator, with coagulants and other chemicals from the feeders, takes out mud, most suspended

matter and hardness. (This clarified water is adequate for the cooling-water system . . . cooling tower, condenser.) Next—the filters remove final traces of suspended matter. The cation exchanger takes out metallic ions (calcium, magnesium, sodium, iron, etc.). The degasifier removes carbon dioxide (formed in the cation exchanger). The anion exchanger takes out chlorides, sulfates, etc. and silica. The deaerating heater preheats the water for the boiler and removes corrosive gases.

Depending on the condition of the raw water and the type of demineralizer, total solids are often reduced to less than 0.2 parts per million!

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DISTRIBUTION . . .

For Tomorrow's Reference: Soda ash—96-p., hardbound book presents analytical methods, chemical reactions, material handling, chemical and physical data, and safety precautions. Wyandotte Chemicals Corp. (Wyandotte, Mich.).

- Butadiene-acrylonitrile copolymer dispersions—technical bulletin offers analysis of physical chemical properties and physical data. Goodyear Tire & Rubber Co., Inc. (Akron, O.).
- Adhesives Est—data sheet lists gluing faults and causes, gives tips to get strong bonds. The Borden Co., Chemical Division (New York).
- Rubber-phenolic molding materials—sixth edition of "Design File" gives 25 case histories of applications of rubber-phenolic molding materials. General Electric Chemical Materials Dept. (Pittsfield, Mass.).
- Hydrogen pamphlet—furnishes facts on the transportation, handling, and storage of hydrogen. #G-5, 35¢, Compressed Gas Association, Inc. (New York).
- Castor oil and derivatives—16-p. catalog gives uses and proposed applications for 90 castor oil products such as soaps, acids, esters. Technical data is also included. Baker Castor Oil Co., Sales Promotion Dept. (New York).
- Piperazine and pyrazine—33-p. brochure supplies literature survey of the chemistry and applications of these materials. Wyandotte Chemicals Corp. (Wyandotte, Mich.).

Expanding Sales Coverage: Atkins, Kroll & Co. (San Francisco), agricultural chemical foreign traders, is opening an office in New York.

• Velsicol Corp. (Chicago) plans to expand foreign trade activities by establishing a separate company, Velsicol International Corp. C. A. Headquartered in Chicago, the firm will have a branch office located in New York.

• Solvents and Chemicals Group is moving into the Dallas-Fort Worth, Texas and Kansas City, Mo. areas. The branches will offer solvents, naphthas, plasticizers, waxes, stearates, weed killers, naval stores and other chemicals in drum to tank-car lots.

• Baird Chemical Corp. (New York) will add sodium lactate and a light grade of 80% lactic acid to its line. Plastic-lined steel drums will replace current glass containers.

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For any information on the use of lead and lead products, write to Federated's Corrosion Advisory Service at the address below or at any of Federated's 13 plants and 23 sales offices across the nation. Or send for Bulletin No. 162, Lead Handbook for the Chemical Process Industries.



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RESEARCH



OMAR COMMITTEE†: From a marriage of chemical and engineering skills, a new formula for rocket research.

Integration: New Force in Rocket Research

Olin Mathieson, Reaction Motors, and Marquardt Aircraft are linking research forces in an attack on rocket problems.

Called OMAR, the combined program integrates the special resources of each company, bolsters Olin Mathieson's position in rocket chemicals research.

Still buzzing over the government's plans for a globe-girdling satellite,* rocketeers this week are getting a look at a new research organization that may help turn such ambition into reality. The undertaking — called OMAR — links Olin Mathieson, Reaction Motors (Denville, N.J.), and Marquardt Aircraft (Van Nuys, Calif.) in an integrated research attack on rocket and ramjet problems.

Tops on OMAR's list are the special fuels and heat-resistant structural materials that are essential to rocket development (*CW, March 26, p. 48*). Through OMAR's unique arrangement, the member firms are trying to make maximum use of their research,

engineering, and production resources in the areas in question.

Guiding the tripartite program is a technical liaison committee headed by Olin Mathieson's Harry Sosnoski (aviation advisor to OM's president). Sosnoski is responsible for establishing a working relationship between OMAR's member firms as the first step in pursuing OMAR's broad objectives. These include:

- Thorough and continuous technical appraisal of the usefulness and capabilities of ramjets and rockets; determination of their practical limits and how to achieve the latter.
- Deciding which rocket power problems can benefit most from OMAR's collective experience and talents.
- Performance of joint research and development so that maximum advantage is taken of mutual knowledge, experience, and facilities.

Familiar Trio: Sosnoski can call on the resources of a trio of companies that are familiar figures on the rocket scene. Olin Mathieson (a major stock-



CHAIRMAN SOSNOSKI: In rocket studies, a premium on liaison.

holder in its OMAR partners) makes both solid and liquid rocket fuels and oxidizers (e.g., fuming nitric acid, ammonia, hydrazine, ethylene oxide).

The company says it can produce, in quantity, any other rocket fuel ingredient (e.g., methanol, oxygen, ozone, hydrogen peroxide, etc.) that may be required. Likely candidate: unsymmetrical dimethyl hydrazine (UDMH), for which Olin Mathieson now has research contracts. Other producers include Food Machinery

† Clockwise (beginning left foreground): Olin Mathieson's L. Kermit Herndon, Joseph McLain; Marquardt's John Drake; nonmember observer; Reaction Motors' Warren Turner; nonmember observer; William Munger; Olin Mathieson's John O'Neill, Jr. and Harry Sosnoski (chairman). Absent: Laurence Rockefeller-staffer, T. Walkowics (vice-chairman).

* Scheduled for ascent during the coming International Geophysical Year (July 1957-Dec. 1958), the instrument-carrying artificial moon is expected to cost \$10 million, rise 200-300 miles above the earth via a three-stage rocket. Purpose: to measure cosmic and solar rays, aid in weather forecasting and radio communication.

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RESEARCH

and Chemical Corp. (Charleston, W. Va.), Aerojet Engineering Corp. (Azusa, Calif.), and Metalectro Corp. (Laurel, Md.).

RMI, founded in 1941, is engaged in research, development, and production of liquid propellant rocket engines, component parts and related applications of high energy power generation. RMI engines power the Air Force X-1 series (first supersonic U.S. aircraft), the supersonic Navy Skyrocket research airplane, and the Air Force XF-91. Other RMI engines have propelled the Air Force MX-774, the Lark guided missile, and Navy Viking research rockets.

In 1948, RMI began looking for ways to apply rocket principles to chemical processing operations, was joined later in this work by Olin Mathieson. A new type of chemical reactor, resulting from this work, is currently undergoing application tests. Olin Mathieson expects that other useful by-products outside the propulsion field will result from the OMAR program.

Marquardt, founded a little over a decade ago, is reputedly the West's largest jet engine research and development organization, produces ramjet engines and related components for missiles and supersonic airplanes.

Sosnoski himself is no newcomer to rockets. A former Naval aviator, he also headed, at one time, the Bureau of Aeronautics' engine research in ramjets, pulsejets, liquid rockets, turbobets, etc. Before joining Olin Mathie-

son, he was senior Washington representative for electronic-producing Lear, Inc., coordinated activities of the firm's five major divisions, as well as corporate headquarters in the Washington area.

Whether the new organization can fulfill its ambitious expectations remains to be seen. But it's a fair bet that other rocket researching companies in the chemical industry will be gauging the success of OMAR with more than casual interest.

These firms will be seeking affirmation of the growing feeling among all that only an integrated chemical-mechanical approach will solve rocket materials problems.

Fertility Gauge

A new peacetime use of radioactivity was stirring interest among farmers this week. The find: a better way to judge fertilizer needs, based on a tracer technique for measuring available phosphates in soil.

Conceived by the U.S. Dept. of Agriculture's Maurice Fried and L. A. Dean at USDA's Beltsville, Md., station, the technique utilizes radioactive fertilizer, measures its assimilation by plants.

The method, tried at some experiment stations equipped to handle radioactive fertilizers, is said to give an accurate gauge of pounds of superphosphate equivalent per acre. USDA feels the research will lead to better tests for other soil nutrients.

Coordinating different research groups within the same laboratory can be difficult enough. But meshing the research of different companies is bound to be a formidable task.

Within the structure of OMAR, each participating company retains its individual research budget and staff, is allowed to patent inventions made by its researchers. The technical liaison committee performs its coordinating function in areas in which the three participating firms have common interests.

Here's how the system will work in the development of liquid fuels:

- Reaction Motors and Marquardt Aviation sets specifications for rocket and ramjet fuels, respec-

tively and independently.

- Olin Mathieson will then take up the actual chemical research on the desired materials (fuels and additives).

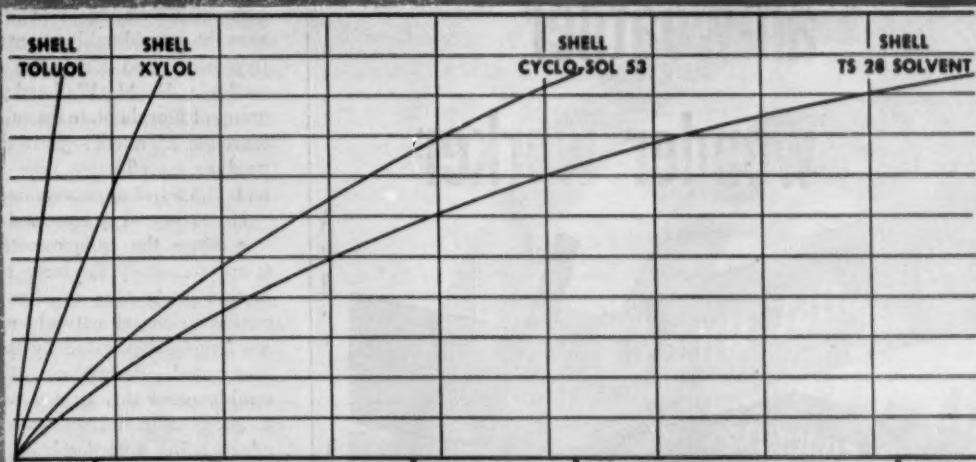
- Promising chemicals arising from this work will then be channeled to the appropriate participant for testing in rocket or jet engines.

- If specifications cannot be met, Olin Mathieson will explain why, so that RMI and Marquardt engineers will be in a better position to develop power plants based on realistic fuel limits.

- Olin Mathieson and, possibly, RMI will be responsible for developing production processes for new fuels that may be developed.

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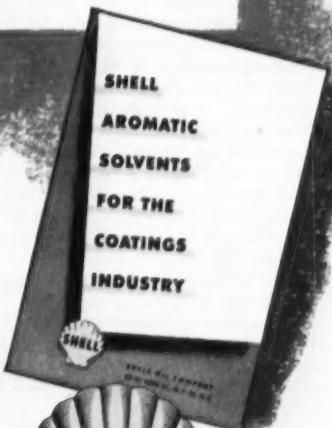
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RESEARCH

Logic's Reward

A recent project at Florida State University is sparking hope that the science of developing new drugs may soon be considerably more scientific. Bypassing traditional "hit or miss" methods, H. M. Walborsky and his group of Florida State researchers have exercised chemical logic to design and produce an effective new antimicrobial: 5,5,5-trifluoronorvaline.

Here's how they reasoned it out:

- Since the trifluoromethyl group is approximately the same size as the methyl group, the relative sizes and configurations of natural amino acids are largely duplicated by these triply fluorinated derivatives. Close resemblance of this kind is essential to a good antimetabolite—the class in which many antimicrobials (e.g., the sulfas) fall. Reason: bacteria must not be able to distinguish between natural "foods" and antimetabolites.
- By trading hydrogen atoms for fluorines, however, the acid is altered so that it is able to tie up enzymes of bacteria, thereby rendering it difficult for the bacteria to utilize food. Result: the bacteria literally starve to death.
- And, unlike the mono- and di-fluoro analogs (which show the same activity), the trifluoro derivative is relatively nontoxic to man.

Proceeding on the basis of this three-part argument, Walborsky and his chemists synthesized three trifluorinated amino acids: 5,5,5-trifluoronorvaline; 6,6,6-trifluoronorleucine; and 5-methyl-6,6,6-trifluoronorleucine. Reward for the exercise of reason was the discovery that the first-named was a very potent inhibitor of *E. coli* bacteria.

Air-Well Bath: An air-well bath, for the detection of free and corrosive sulfur compounds, is now available from Modern Laboratory Equipment Co., Inc. (New York).

Insect Fighters: Two new developments bode well for the continuing chemical war on insects.

• A promising water-soluble systemic insecticide for cotton has been uncovered in studies at the University of California's citrus experiment station (Riverside). Under researcher R. L. Metcalf, the California group prepared O,O-diethyl S-2 ethyl mercaptoethyl phosphorothiolate methosulfate,

discovered it to possess high systemic activity in cotton plants. The compound is a derivative of the thiol isomer of Systox.

• Walter Lorenz, of Farbenfabriken Bayer A.G., is credited with discovering the insecticidal activity of β,β,β -trichloro- α -hydroxymethylphosphonic acid dimethyl ester. Obtained by treating chloral with dimethyl phosphite, the agent is said to be particularly active against flies. A recent U.S. patent (2,701,225) deals with the compound.

Agreed on Sugar: Sugar Research Foundation last week signed a contract with Battelle Memorial Institute to continue support of the latter's sucrochemical studies. Part of a comprehensive program of SRF-supported research (at various institutions), the Battelle investigation is devoted to the development of sugar derivatives for agricultural applications.

Pressure Aid: Four new hypotensive ester alkaloids have been isolated from commercial *Veratrum viride* by chemists of Ayerst, McKenna and Harrison (Montreal). They are called germ budine, neogerm budine, isogermidine and neoprotoveratrine. All are reported to be more active than the mixed alkaloid ester preparation from the host plant.

Atomic Activity: Pennsylvania State University is the first institution to receive a reactor license from Atomic Energy Commission under the government's program of encouraging civilian participation in atomic energy. The recently issued license, which runs through June 30, 1956, authorizes the university to receive and use up to 3600 grams of contained uranium-235 fuel in a low-power swimming-pool type of reactor.

Other organizations that have applied for reactor licenses are: University of Michigan, University of California at L.A., North Carolina State College (which is already operating a reactor under an interim license), Armour Research Foundation, Battelle Memorial Institute, Massachusetts Institute of Technology, Naval Research Laboratory, Consolidated Edison Co. of New York and Commonwealth Edison Co. of Chicago.

• In line with burgeoning nuclear research activity is the initiation by American Machine & Foundry of quan-

Planning a



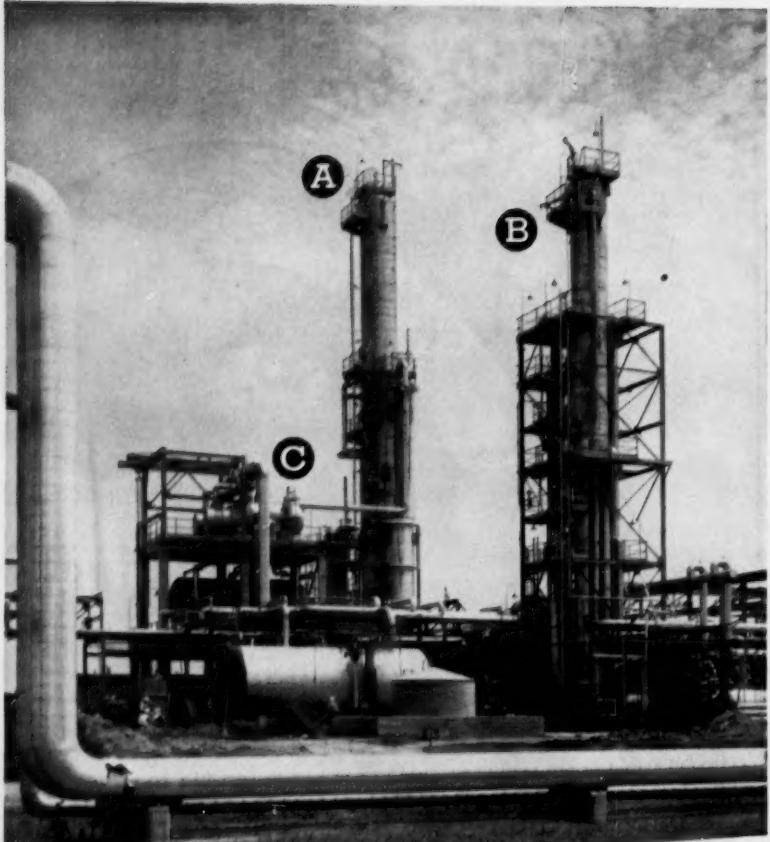
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These structures were fabricated and erected by CB&I for the Lummus Company and are located at the National Petro Chemicals Corporation, Tuscola, Illinois.

RESEARCH

ity production of "master slave manipulators." Remote control devices for handling radioactive materials, master slave manipulators previously were all custom-made. AMF's model was developed in Argonne National Laboratory, comes in left- and right-handed form.

Plastics Gain: The plastics research firm of DeBell & Richardson has recently doubled its potential working area by purchasing the A. W. Dolge Co. mill adjacent to the former's site in Hazardville, Conn. The added 20,000 sq. ft. of space will be devoted to laboratories and pilot plants.

Liberated: Infrared radiation and materials research are dealt with in two newly released government research reports:

- Prepared by Wright Air Development Center, publication PB 111648 contains abstracts of investigations in metallurgy, textiles, rubbers, plastics, petroleum products, protective treatments, etc., performed (during '53-'54) under the Air Force's materials research and development program. Cost: \$2.75. Source: Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.

- PB 111643 is a 347-page bibliography said to contain all references to literature on infrared published from 1935 to 1951. It's available from OTS, for \$3.

New Grip: A new type of laboratory clamp is offered by R. I. Mendels (New York). The device utilizes a band of spring steel to grip the entire circumference of glassware in its grasp. One big claimed advantage of band clamps over ordinary clamps: less breakage of glassware. The product is available in three diameters: 1-2 in.; 2-3 in.; 3-6 in.

Mail-Order Sleuths: A new mail service for locating sources of organic chemicals has been organized by former Wellcome researchers L. E. MacKay and E. A. Falco. Address: Box 224, New Rochelle, N.Y.

Ready To Go: Final building plans for General Foods' proposed new Tarrytown, N.Y., research center were approved last week by the company's board of directors. The plans call for several two-story buildings on a cam-

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pus-like 55-acre site. Working space for about 650 persons will be provided. Construction is expected to take about two years during which time General Foods researchers (of the firm's Hoboken, N.J., laboratories) will be seeking to relocate. Assistance (financial and otherwise) in coping with relocation problems is being extended to employees by the company.

Black Buildup: Thermatomic Carbon (an affiliate of Commercial Solvents) is in the process of expanding research at its Sterlington, La., plant. New facilities (laboratories and offices), now under construction, will be under the supervision of Frederick Barlow, recently engaged by the firm. Plant expansion, also under way, will permit Thermatomic to boost carbon black production by 15% early next year.

Standards: Three new standard hydrocarbon samples may be had from the American Petroleum Institute project at Carnegie Institute of Technology. Comprising 3,4-dimethyl-trans-2-pentene, 2-methyl-trans-3-heptene, and 3-cyclopentyl-1-propene, the offering (\$50/5 ml.) is administered by the institute's petroleum research laboratory under Frederick Rossini.

The total of American Petroleum Institute standard hydrocarbon samples now available from Carnegie Tech is 23.

Moving: The Air Force's Office of Scientific Research, located at Air Research and Development Command headquarters (Baltimore, Md.) since the former's establishment in 1952, will soon be set up as a separate activity in the Washington, D.C., area. Purpose of the move: to increase emphasis on basic research, provide closer liaison with other government research organizations.

Bromine Adder: Commercial quantities of a novel brominating agent, dibromodimethyl hydantoin (DBDMH), are now available from Glyco Products Co., Inc. (New York). The product features high bromine content (54%), is reputedly advantageous in allylic brominations.

Chaulmoogric Synthesis: New York University researchers Kurt Mislow and I. V. Steinberg have reported the synthesis of chaulmoogric acid—one-

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*Reference: Vol. XVIII,
No. 4, October, 1954,
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Chemical Week

RESEARCH

time mainstay of leprosy therapy. The find is expected to aid insight into certain fat structures.

New Counter: A new liquid scintillation spectrometer for counting beta samples in solution with liquid phosphors is available from Packard Instrument Co. (La Grange, Ill.). Typical use: counting tritium in ground water studies (e.g., pollution and water disposal problems).

Diamine Debut: Experimental quantities of three new diamines are newly available from the petrochemical division of Commercial Solvents. They are N¹-isopropyl-2-methyl-1,2-propanediamine; N¹-phenyl-2-methyl-1,2-propanediamine; N¹-(1,1-dimethyl-2-hydroxyethyl)-2-methyl-1,2-propanediamine. Suggested applications: epoxy curing agents; stabilizers for melamines; alkaline catalysts; intermediates in the synthesis of dyes, drugs and surface-active agents. The new chemicals are derivatives of nitroparaffins that will be produced at the company's new Sterlington, La., plant.

Potent: A new stabilizer of anhydrous ether is now in commercial use. It's sodium diethyldithiocarbamate and it's being utilized by Mallinckrodt. According to the company, only 0.05 ppm. of the compound is sufficient to inhibit the formation of aldehydes and peroxides.

Titanate Lowdown: Slip casting of barium titanate (CW, June 25, p. 64) is the subject of a recently released government research report. Valuable in the production of electrical ceramics, the technique described should help to remove one of the major barriers to increased use of barium titanate in ceramics. Details of the process are contained in report PB 111629, available from Office of Technical Services, U.S. Dept. of Commerce. Cost: 50¢.

Opportunity: Illinois Institute of Technology (Chicago) will offer a course in the chemical aspects of nuclear energy during the fall semester. Focal point will be an examination of the chemical problems involved in the functioning of nuclear reactors. Joseph Katz, senior chemist at Argonne National Laboratory (of AEC), will lecture.

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UNITED PRESS

ELM CUTTING: Because there's no sure cure, this drastic step's needed.

Antifungal Aid for Shade Saving

As Dutch Elm disease spreads across the nation, more gardeners, arborists and municipalities turn to agricultural chemists for help.

Several chemicals, applied by special techniques, have been shown to combat the blight—but none is 100% effective.

The market for a sure cure? One estimate is that \$5-million worth of chemicals could be sold yearly.

The old psychological axiom, that one perceives in terms of one's needs, was demonstrated anew a few weeks ago. The U.S. Patent Office granted a patent (U.S. Pat. 2,712,202) for the treatment of the tree diseases—Dutch Elm disease in particular—and over-hopeful newsmen soon spread the word nationwide that this scourge of shade trees had been licked.

The need for such a cure is all too plain. The Dutch Elm disease has ruined trees—virtually wiped them out in some areas—throughout the Northeast and upper Midwest. In a sombre communication a few weeks ago, the Illinois state natural history survey announced that 67 of that state's 102

counties now have blighted elms, where only 55 had it the previous year. Elsewhere, park directors and municipal officials have watched Dutch Elm deface their parks and public squares.

But despite the need (and a reward of a product that might sell at a \$3-5 million/year clip), the unhappy fact remains that no 100% cure for the fungus disease has been found. The Rhode Island Experiment Station, which, with chemicals supplied by American Cyanamid,* received the patent, admits that al-

* The most effective compound, according to the patent, is a reaction product of sodium 4-, 5-dimethyl-2-mercaptothiazole and chloroacetic acid—sodium 4-, 5-dimethyl-2-thiazolylmercaptoacetate. It is not commercially available.

SPECIALTIES . . .

though it has gotten some exceedingly encouraging results with its treatment, it cannot get good results all the time, and it is still probing for more effective treatments.

Rhode Island experimenters, directed by Frank Howard, are not the only group working on the disease. To mention some of the research teams, Connecticut has its agriculture experiment station seeking chemotherapeutics; Illinois and Massachusetts have hit the problem, and the U.S. Dept. of Agriculture is investigating it both at Beltsville and Columbus, O., farms.

Besides these, several private groups have worked on the problem, claim to have devised cures.

Sizing it Up: Dutch Elm disease is a fungus disease; it has been noted in this country since the late '20s. In the last 15 years, it has become a serious concern in wide areas of the nation.

The fungus is transmitted by European and American bark beetles—hence early treatment was to remove and burn all trees which might harbor carrier insects. The process (which has cost the federal government nearly \$20 million in the past quarter-century) has been only partly effective.

Lately, it has been supplemented by spraying with a 12% emulsion of DDT or other insecticide, to wipe out the beetles. This, too, has had limited effectiveness.

Somehow, infected beetles continue to attack healthy trees, inoculate them with fungus spores as they bite the trees for feeding. With the spores in the tree's sap system, tendrils of the fungus grow in the fluid-carrying channels, releasing toxins which eventually kill the tree. It has been definitely shown that, although the fungus grows in the sap routes, the killing is not due to a physical blocking of these paths.

Unwanted Guest: Much of the effort to lick Dutch Elm has been directed toward killing the fungus. To do this without damage to the host tree is a tough problem. One of the many compounds suggested for this is A. E. Dimond's (of the Connecticut Experiment Station) 2-methylcarboxy-mercaptobenzothiazole (CW, Feb. 2, 1952, p. 38).

Foliage-applied, and simple to handle, it has proved encouraging, and is still being tested. But it is

SPECIALTIES . . .

admittedly not yet the final answer.

Carolate (a tradename—for discoverer Nestor Carolselli—composition of 99% lime, salicylic acid and urea) was worked out to counteract the toxic agent produced by the fungus (exact nature of this toxic compound has not been determined). Injected in the ground by expensive pressure equipment, it's only semisuccessful.

Rhode Island workers are currently working on another antitoxin approach—to inhibit the enzymes that could be producing these toxins.

Another Rhode Island contribution has been the "tangential" method of introducing chemotherapeuticants—horizontal drillholes, tangential to the plant's cambium layer, are made at various levels in the tree-trunk, so that the chemical is introduced to almost the entire sap system (since a tree hasn't a circulatory system, translocation of sap-borne agents is otherwise incomplete).

Soil Approach: Not everyone, however, believes the work of these state testing stations. In Illinois, J. David Larson is pushing a treatment using "normal" soil. This he makes (by a patent-pending process) of powdered granite, limestone and gypsum, mixed with factory canning wastes, sewage, or the like. It's his theory that ordinary soil becomes depleted of some of the 20 elements needed for sturdy tree growth—and sap deficient in these elements is susceptible to fungus growth. Normal soil, Larson says, restores healthy balance to played-out soils (in the case of Dutch Elm, he believes that a phosphate excess and a sulfate shortage causes the blight).

For several reasons—a reluctance to reach agreements on soil-testing procedure[†], difficulties in setting up test plots, to name a few—there have been no independent tests run of Larson's treatment.

There is agreement in one area, however: that prevention is the best way to combat Dutch Elm disease. Most agriculture experiment stations believe that with materials at hand, and with those under development, the disease can be checked where strong, intelligent efforts are made to do so. They are sure the trees won't be wiped out by Dutch Elm disease, as chestnut trees were by a blight 50 years ago.

[†] Lauck's Testing Laboratories, Seattle currently does his tests, which he says involve spectrographic and radiographic analyses.

Box Score Goes Up

It now looks as if the long-predicted scramble in heavy-duty dry bleaches (CW, Nov. 21, '53, p. 81) is getting underway. Hilex Co., Inc. (St. Paul, Minn.) has just introduced its spray-dried Hi-lex Bleach in its home area; Purex is moving a box-packed bleach East from the West Coast; and Linco products (Chicago) has scheduled a dry bleach for introduction soon.

All the new bleaches are based on dichlorodimethylhydantoin (DDH, Halane), the Wyandotte compound that can be made into a stable, dry, home bleach (in water, Halane slowly produces sodium hypochlorite). Products made with this first hit a limited market in the fall of 1953, got a bigger boost when Colgate began test marketing Pruf in the spring of 1954.

Spray-Dried or Not: With the exception of Purex's new compound (Beads o' Bleach), all the new bleaches are spray-dried products sold in one-pound boxes for about 37-39¢ at most stores. Purex has a mechanical mixture of powdered Halane with a built detergent; it puts 18 ounces in the same-size box.

Now that Purex is substituting its Halane bleach for the calcium hypochlorite type with which it entered the dry-bleach business, the major impetus behind the calcium types is gone. But the search for other chlorine-releasing compounds, to compete with DDH, has been spurred.

One compound getting considerable interest is trichlorocyanuric acid (TCA). Monsanto (CW, Jan. 15, p. 56) and American Cyanamid have shown particular concern about its commercial possibilities. Oakite is now producing an industrial cleaning compound made with it.

But a major problem for firms hoping to compete with Wyandotte on Halane is the one of price—Halane at 50¢/lb. is well under likely prices for other products. And patent matters, starting-up difficulties and similar concerns will likely keep other firms from making and selling DDH.

Small Part: In the bleaches compounded for home use, the DDH is only a small part of the formula—generally about 10%, to give 6-7% available chlorine. Rest of the formulation is "inert"—includes a low percentage of detergent, plus phosphate builders, sodium sulfate, etc.

Although Halane formulations can be spray-dried, such an operation with a chlorine-containing compound is decidedly tricky. Theobold Industries, Inc. (Kearny, N.J.) has been a leading developer of the spray-dry techniques, is currently producing all of the spray-dried household products.

So far, the heavy-duty dry bleaches (distinguished from the light-duty, perborate types) are still pretty much in the introductory stage. To a certain degree, the housewife must be educated to the new bleach form. For bleach makers like Hilex and Purex,



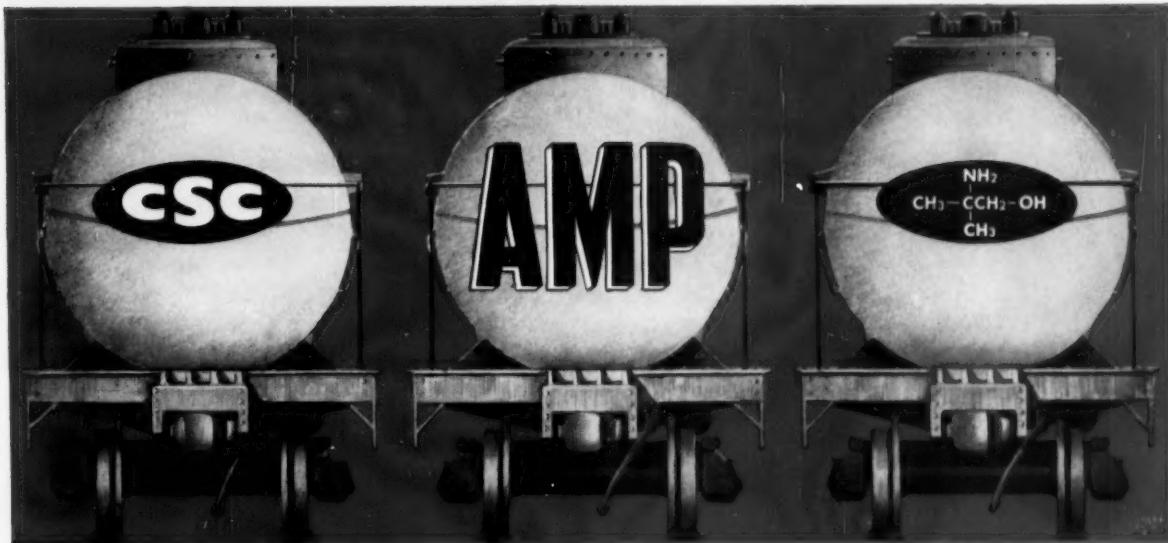
DRY-BLEACH LINEUP: Four to choose from now.

this shouldn't be difficult, however—and the product gives a strong new talking point advertising wise. Some firms now emphasize that they give the housewife a choice of two products—to underline the close relationship between the products, Hilex has labeled its boxed and bottled products similarly.

Under one sponsorship or another, the dry bleaches are available now in many of the larger marketing areas clear across the nation. The time's fast coming when they'll be familiar to housewives everywhere.

Initial Incentive: To help sell Tipon Gold Touch-up (paint in a stick), a set of 62 reusable stencils is included in a \$1.49 kit for painting monograms and initials on personal belongings.

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Solubility in Water at 20°C, g./100 ml	Completely Miscible

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SPECIALTIES

Tinless Cans

It is now possible to make metal containers without using any tin. A new tinless organic solder, developed by Dewey & Almy Chemical Co. (division, W. R. Grace & Co., Cambridge, Mass.), is described as a thermoplastic organic material with "excellent adhesion to plain metal as well as to most of the interior lacquer coatings used in cans today." The new solder is an extension of similar low-strength cements D&A made several years ago.

Not only does the new solder promise to eliminate container-makers' dependence on tin imports; it also eliminates the "solder stripe" on the can, permits a continuous enamel label.

Applied at a temperature of 345 F., the product is not affected by normal food processing temperatures (240 F. for 30 minutes). The organic solder, D&A says, tests an average of 15 pounds stronger than tin-lead solders.

The low-strength solders have been

used successfully for several years on motor oil cans. The new material has, so far, been used only for frozen concentrate cans and for tomato paste.

To Hide Behind: Southern Clays, Inc. (New York) claims good hiding characteristics for its new heat-treated aluminum silicate pigment for paint. The pigment can be used as a low-cost partial replacement for titanium dioxide.

Sticky Research: Stein, Hall & Co., Inc., is expanding adhesives research at its Long Island City, N.Y., laboratory. In an accompanying reorganization, the liquid-adhesive laboratory and the Stein-Davis laboratory have been combined into one unit, with a technical service group and a research and development group.

Knotty Solution: Low-cost knotty lumber will be less expensive to use in construction with a new combination



Do It Yourself in Africa

THIS GROUP of Gold Coast farmers is learning how to mix insecticide solution to spray young cocoa trees and protect them from leaf bugs. In addition, they are taught to recognize for themselves the early symptoms of swollen shoot; the value of regular harvesting and

prompt removal of diseased pods. Mixing the spray in the demonstration is a member of one of 16 special teams sent out by the Gold Coast Ministry of Agriculture. The farmers will be provided with spray guns, their cost subsidized by the government.

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SPECIALTIES

one-coat knot sealing and priming compound. The Western Pine Assn. (Portland, Ore.) developed the coating to eliminate one step in the finishing operation. Phenolic and vinyl resins seal excess pitch into wood knots, prevent discoloration of the finish, are incorporated with pigments to make a primer coat. The wood is thus prepared for oil, alkyd and oleoresinous paints. Twenty-one paint manufacturers are making the finish.

For Readers: Metalweld, Inc. (Philadelphia) has a bulletin on synthetic resin coatings, which covers vinyl, phenolic, saran, polyethylene, Epon, Neoprene, plastisol and silicone coatings.

To explain uses of its new diethylene glycol mono laurate, Witco DGL, Witco Chemical Co. (New York) is offering a bulletin that shows potential applications in the paint, cosmetics, metal working, plastics, and textile industries. Witco also has issued a new bulletin on its DGO, diethylene glycol oleate, which has applications in many of the same industries.

"Handy Soap and Synthetic Detergent Buying Guide" gives data on Colgate-Palmolive Co.'s line of toilet and bath soaps, pumice and liquid hand soaps, packaged synthetic detergents, scouring cleanser, flakes and granulated soaps in bulk containers, and other industrial products. Designed for institutional and industrial users, the guide is available from Colgate's Industrial Dept. sales representatives.

Cosmetic Coalescence: Chesebrough Manufacturing Co., (Vaseline hair tonic, petroleum jelly) and Pond's Extract Co. (Pond's Cold Cream and other cosmetics and facial tissues), both of New York, have merged. New name: Chesebrough-Pond's, Inc.

No Knots: For weavers, an adhesive has been developed to take the place of hard-to-handle knots for splicing yarns (operation must be interrupted to pull knots through). Spliceclip, made by Adhesive Products Corp. (New York), is a fast-setting flexible adhesive which the loom operator simply applies to the end of the yarn.

Paint Plant: Du Pont will build a new plant at Tucker, Ga. (near Atlanta),

to make paints, enamels and thinners for household, industrial, and automotive use. Eighty persons will be employed at the two-level manufacturing and warehouse building. At the same site, a sales office and warehouse building will be built to handle Atlanta area business.

Cutless: For packing houses, an extra-hard cutting board has been developed. Designed to last six times as long as untreated maple, not soak up juice or odors, the new impregnated "densified" birch is made by Chem-Wood Products, Harbor Island, Wash. Air is exhausted from the birch slabs in a vacuum tank, phenolic resin is introduced under high pressure and the board is cured in a hot press.

The Forgotten Sex: Aerosol hair grooms have long been available for women, but now Aerosol Corporation of the South (Memphis, Tenn.) has what it thinks is the first one for men. Lord Donamar, selling at \$1.25/6-oz. Crown can, will have a formula entirely different, the company says, from the women's spray, as well as a more "masculine" scent.

Tube Deodorant: Creams have 65-70% of the \$40-million deodorant market—a sales increase, but a percentage loss from their 85-90% of the \$24-million market in 1947. Chief competition: sprays, lotions, ball-bearing packages which keep fingers ungreasy.

General Cosmetics Corp. (Chicago) has a new package for the still-preferred cream which may shift the market back again. General's new Key Deodorant Cream (the cream itself isn't new—its active ingredient is aluminum chlorhydroxide complex) is in a plastic tube ("doesn't lose shape") with a convex perforated head. Fingers don't touch the cream—it can be applied directly from the tube. The 2-oz. tube sells for \$1.

New Yellow: Two new yellow food colors are offered by Charles Pfizer & Co., Inc. (New York). Both, says the company, show good uniformity, stability and compatibility to blending with vitamin A. They are Pfizer Vegetable Color (an oil-soluble 20% suspension of microcrystalline annatto color in refined winterized cottonseed oil), and Pfizer Betal Carotene.

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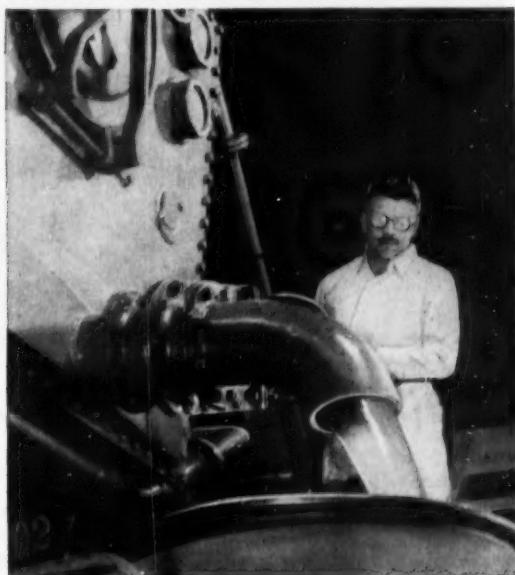


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Iso-Octyl Alcohol
Decyl Alcohol
Denatured Ethyl Alcohol

CHEMICAL

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PETROHOL 95
PETROHOL 99
JAYSON
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Denatured Ethyl Alcohol
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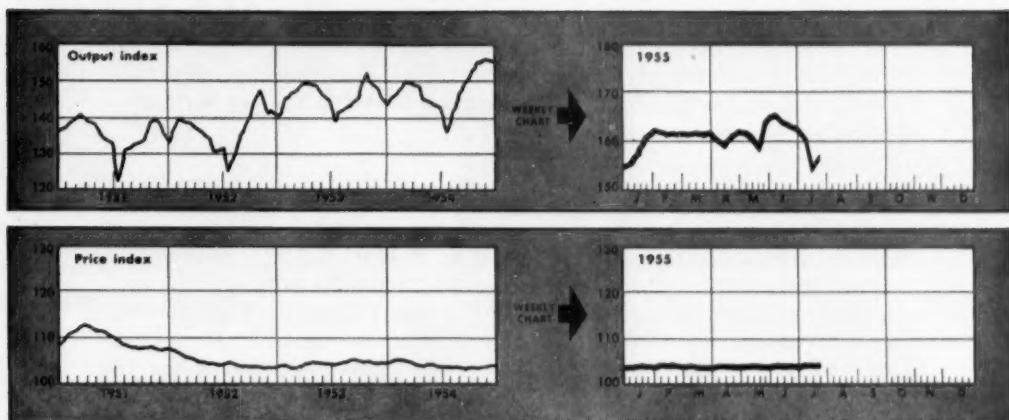
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M A R K E T S



WEEKLY BUSINESS INDICATORS

CHEMICAL WEEK Output Index (1947-49=100)
 CHEMICAL WEEK Wholesale Price Index (1947=100)
 Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947-49=100)	158.5	158.0	138.7
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.4	104.3	104.2
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	451.6	467.9	320.0

MONTHLY INDICATORS—Production (Index 1947-49=100)

All Manufacturing and Mining
 All Chemical Products
 Industrial Chemicals

	Latest Month	Preceding Month	Year Ago
All Manufacturing and Mining	138	138	124
All Chemical Products	164	164	144
Industrial Chemicals	182	182	152

MARKET LETTER

Acrylonitrile prices have taken another dive. The latest (4¢/lb., in tanks) is the third in a year, brings the cumulative cut in that time, to 16¢. New consumer-luring 27¢ tag, initiated by American Cyanamid, caught most other marketers off-base. Surprise, though, was not numbing enough to forestall an almost immediate emulation.

Incidentally, the strike last week, which idled American Cy's estimated 75-million-lbs./year acrylo plant at Fortier, La., shouldn't result in a shorting of customers. Company tells CW: "We are fortunate at this time to be able to meet foreseeable customer requirements." This is possible, adds the spokesman, because of output from the firm's other acrylonitrile plant at Warners, N. J.

On the other hand, cresylic acid users are still feeling the pinch of a tight market. The condition applies to both imported (ADF) and domestic material. And adding an extra squeeze are this week's reluctantly hiked prices on some foreign cresylic.

The increases (10¢/gal. on c.l. quantities; 8½¢ on bulk) were applied here by sellers who profess they'd rather have maintained the previous under-U.S. 75¢/gal. price. Rising manufacturing costs, in England chiefly (e.g., an 18% increase in cost of coal, higher rail-strike-induced freight rates, labor), were pressures too strong to buck.

The newer cresylic prices, however, may have one market-brightening effect; the incentive of a better price could attract more ADF cresylic to these shores.

MARKET LETTER

An added note on the cresylic-acid situation: there's no official word yet on whether or not domestic prices will move up, but trade talk has it that producers aren't happy about the disappearing differential between U.S. and imported prices. Speculation making the rounds: new—and higher—schedules are in the works.

Still up in the air is outcome of the General Services Administration-Du Pont discussions on whether or not Tennessee will get a new estimated 7,500-ton/year titanium plant (*CW Market Letter, March 26*).

Dickering has dragged on for some 20 months now, and the decision deadline has again been advanced—this time to Aug. 31. Biggest stumbling block to signing of the U.S.-Du Pont contract—urged by some interested senators—is reportedly the current lack of strong demand for the lightweight metal.

Meanwhile, other developments are swinging the spotlight to the newer sodium reduction (as opposed to the older Kroll magnesium) process of making titanium. Early last week Columbia-Southern Chemical and Imperial Chemical Industries made application to build such a plant here (see p. 14).

A couple days later, Electro Metallurgical Division of Union Carbide revealed the source of the sodium it will need at its now-building titanium sponge plant at Ashtabula, O. The sodium seller: U.S. Industrial Chemical's Ashtabula works.

The Electromet plant is due in by mid-'56; capacity, about 7,500 tons/year—coincidentally matching Du Pont's "iffy" installation.

There was little doubt that strikes plaguing the copper industry would spawn higher copper chemical prices. First to feel the nudge: copper sulfate. CP material is up $\frac{1}{4}\text{¢}/\text{lb}$, to 19.4¢ in bbls., f.o.b. works. Crystal (99%) now costs 25¢/cwt. more, is pegged at \$12.50/cwt. (bags, c.l., f.o.b. works, freight equalized).

Some copper carbonate customers, too, are paying more; 55% material is priced this week at $30\frac{1}{2}\text{¢}$ to 32¢/lb. (depending on quantity), an increase of about $\frac{1}{2}\text{¢}/\text{lb}$.

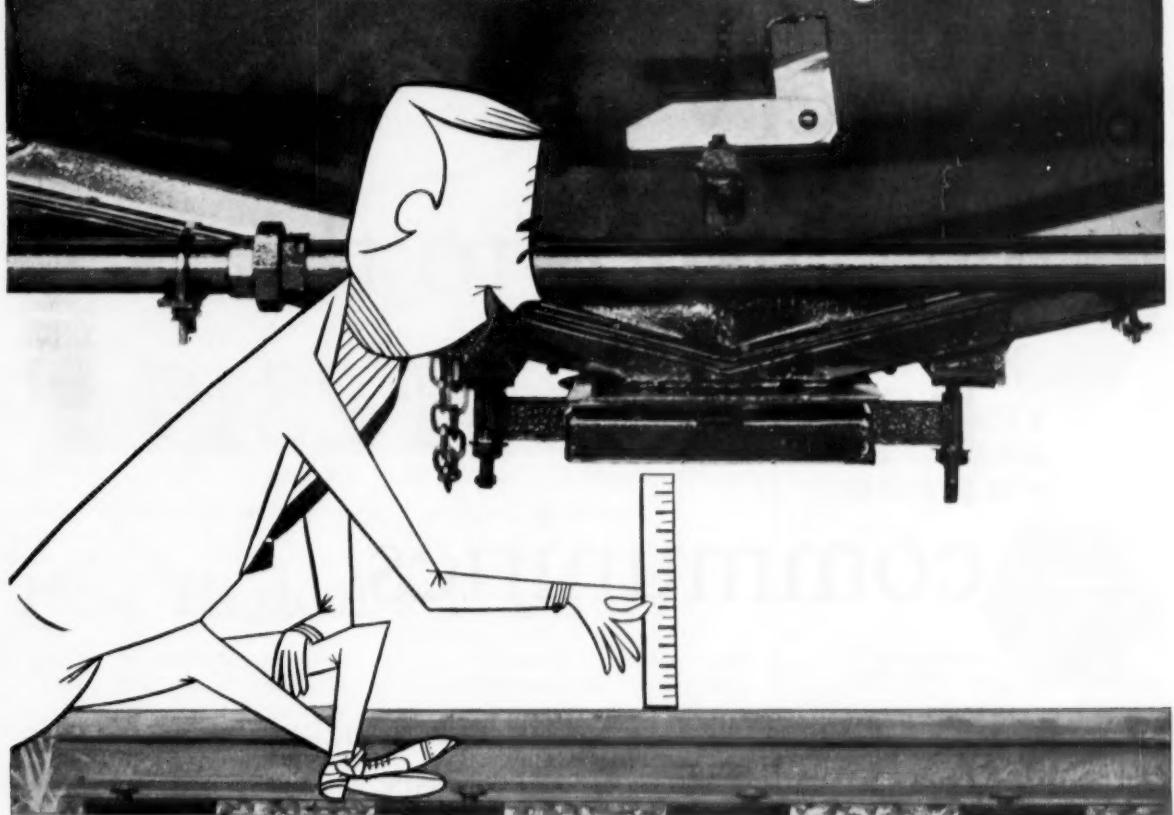
Primary spot copper price in the U.S. remains at the 36¢/lb. level, but most observers will give odds that a hike is imminent. Reasons are obvious: the copper strike is apparently headed for settlement—on the basis of higher wages; spot price on the London market is hovering around 45¢/lb.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending August 8, 1955

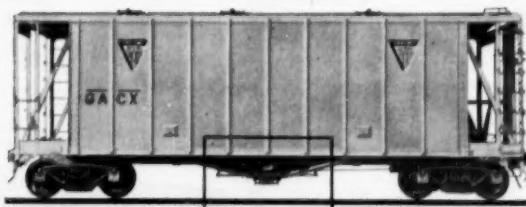
UP	Change	New Price	Change	New Price	
Copper carbonate, 55%, bgs., works	\$.005	\$.305	Phosphate rock, Fla., land pebble, washed, dried, unground, 68-66%, b.p.l., bulk, c.l., mines, long ton	\$.075	\$ 4.76
Copper sulfate, CP, gran., bbls., works	.0025	.1940			
<hr/>					
DOWN			Mercury, Metal, 76 lb. per flask, net flask		
Acrylonitrile, tanks, works	\$.04	\$.27		\$ 6.00 \$ 258.00	

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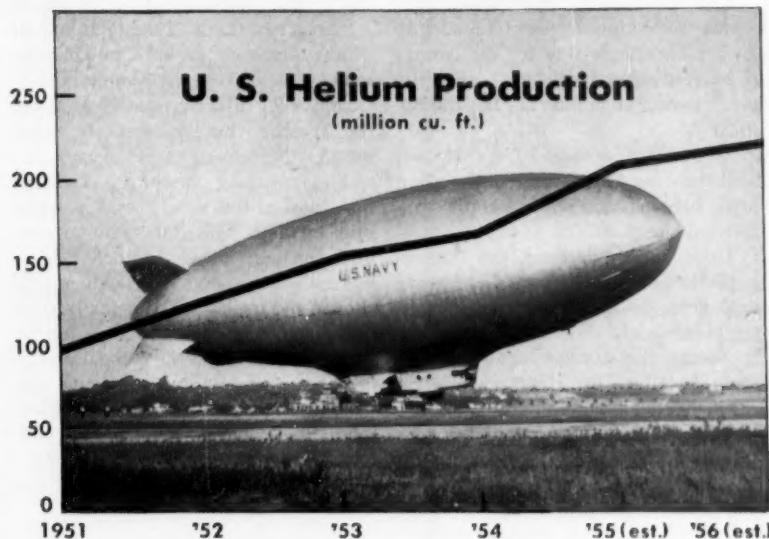
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MARKETS



HELIUM CONSUMPTION, emulating a prime use, heads high.

How High the Market?

"...present producing plants . . . will one day—probably within two or three years—be completely inadequate to satisfy upcoming helium uses . . ." (CW, Nov. 28, '53, p. 77).

By this week it's apparent that helium's cloud-grazing consumption curve (see chart) will compress, by a few months at least, fulfillment of that now-two-year-old prediction.

The Bureau of Mines has just revealed that it will build—and have in operation within 10 or 12 months—a \$6-million plant near the present helium installation at Exell, Tex.

The new 100 million cu. ft./year plant will bring the number of U.S.-operated helium producers to 5,* hike

*The others: Shiprock, New Mex.; Amarillo and Exell, Tex.; Otis, Kan.

total capacity 50% over the current 200 million potential. But turnout today falls short of filling ballooning demand.

It becomes obvious, then, why Washington chose the Texas Panhandle for the new unit. The location will permit increased production of helium in the shortest possible time.

Despite Exell's ability to process some 85 million cu. ft./year of helium, much of the raw material gas is going right by the plant. The new set-up will simply tap in, almost immediately begin augmenting helium production from the current gas operations.

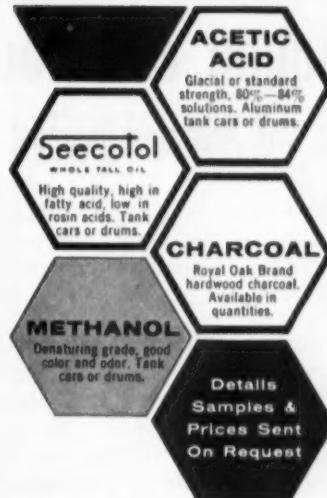
Up . . . and Beyond: During the years of depressed helium needs, about 88 million cu. ft. of Exell's output was pumped into underground storage areas.

Now a Private Producer?

IF NATURAL GAS SOURCES in the area prove abundant, Apache Oil and Helium Corp., Phoenix, Ariz., plans to build a \$10-12 million ammonia plant—and helium will be a by-product. Next week the firm begins drilling operations on the third of six well-sites. (The second well spewed helium gas at 1,000 ft., natural gas at 2,100 ft.)

The Bureau of Mines scouted the same Arizona well-sites, concluded that a primary helium processing installation was not economically justified.

When—and if—Apache's by-product helium is available, it will be the first nongovernment material to hit the market since the '30's.



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MARKETS

This hoard, now being dipped into—plus some improvements made at each plant—made way for the better-than-rated-capacity helium consumption (some 212 million cu. ft.) during fiscal '55.

An estimate for fiscal 1956, that may well turn out to be conservative, has total helium requirements crowding 236 million cu. ft.

To meet this demand, the bureau hopes to produce—barring shutdowns, explosions, or other production-crippling events—only about 216 million cu. ft. during the current fiscal period—some 20 million lbs. short of needs.

Further compounding the present, and future, supply-strapping: the 236 million cu. ft. estimate of helium consumption does not take into consideration growing needs of so-called "civil-

ian" (nongovernmental) consumers.

About two-thirds of the total helium production goes directly to defense-related agencies—to the Atomic Energy Commission, all three military services, the Weather Bureau, and (to some extent) the Bureau of Standards.

The remaining one-third is commercial. Most of this latter category, however—perhaps 65%—filters into government-inspired uses. Another 5% is medically consumed. Thus only a 30% slice of the civilian third actually goes to less essential civilian outlets. These include welding and the comparatively newer spectrometer leak detection applied to nonmilitary items. (Other small uses, such as toy balloons and advertising, together normally dip into the nongovernmental helium pot for something less than 2%.)



Acid Test for Polyethylene

ILLUSTRATIVE of polyethylene's versatility are poly-coated paper liners for lemon crates (see cut). Object: to protect fruit against moisture, fungi, and acid residue.

Crown Zellerbach (North Portland, Ore.), one of the first West Coast producers of such papers, now provides polyethylene packaging materials for chemicals.

Papers of many types, from tissue to heavy board, will help whittle down a predicted large surplus of the plastic (CW, July 16, p. 69). Still a relatively small, though fast-growing, outlet, paper and film coatings are expected to absorb some 36 million lbs. of poly, or about 12% of the 300 million lbs. of total sales anticipated this year.

Pertinent Poser: Demand towering over the supply, of course, raises an insistent who-gets-how-much question, or more specifically, who-gets-how-much-less. The entire nongovernment helium supply is sold to such companies as Linde and Air Reduction, who, in turn, market among ultimate users.

A few months ago, at the start of the current pinch, the Bureau of Mines requested these companies to scratch toy balloons and advertising helium customers from their sales lists, give preference to medical uses and government contractors.

The pruning of these relatively insignificant helium consumers, of course, did little to bridge the gulf between available supply and desperate need. Consequently, direct government usage also came in for a paring. One suggested method: switch from use of all-helium in welding to all-argon, or at least to a mixture of the two. (Argon, incidentally, is currently freely available.)

In another changed procedure, instituted since the shortage began, government users were asked to indicate each month's helium requirements on the 20th of the preceding month, and to space deliveries to maintain continuous plant production. August is the first month in which this has been done. Results: after satisfying these agency requirements (and those of government contractors), it's estimated that about 75% of the country's non-defense requirements will be filled.

So far the system appears to be working out—well enough, at any rate, to forestall initiating a formal helium allocation program.

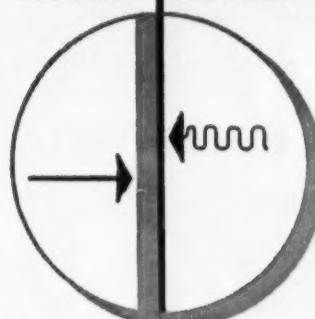
There are two eventualities, though, which could bring pressure for formal helium rationing: a sharp step-up in military demand; a breakdown at one of the Bureau of Mines plants.

When the latest helium installation at Exell hits its full rated capacity next year, the additional 100 million cu. ft. will likely reverse the current supply/demand condition for at least three years. And since it takes (on the average) about three years to get a request for new facilities translated into a going operation, the Bureau of Mines is even now readying a proposal for another plant in 1959.

That's more proof, if any more is needed, that helium markets, over the long term, show no signs of deflating.

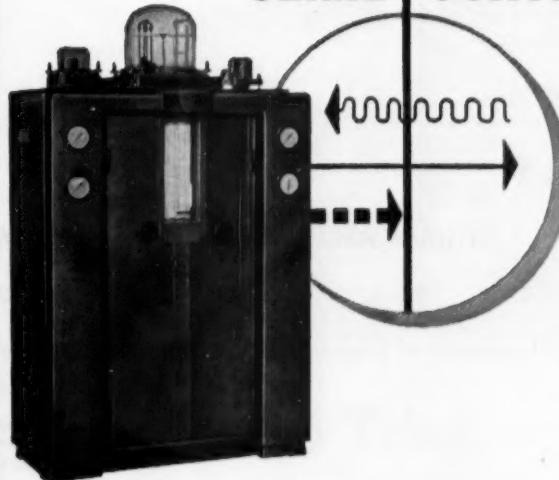
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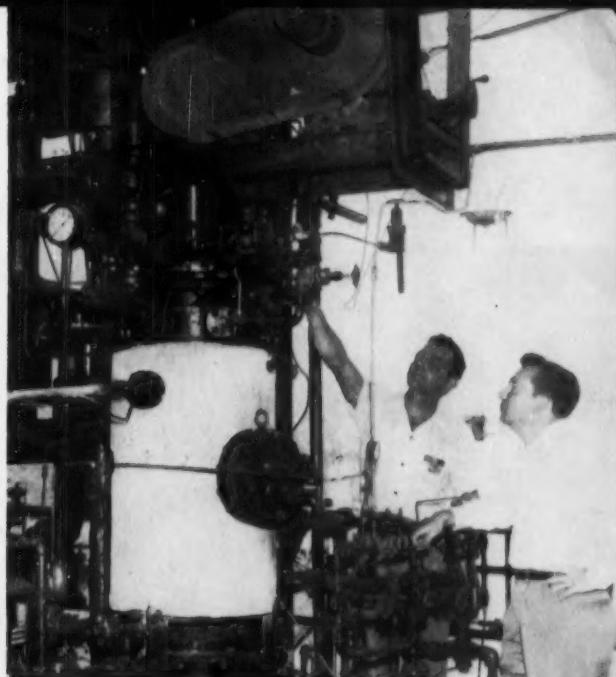


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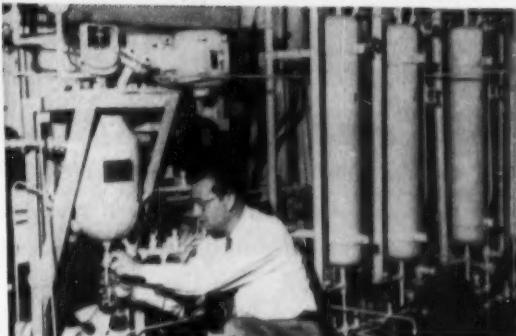
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PRODUCTION



Carbide's Montagna (*above*) developed an air oxidation that converted hexadienal to sorbic acid. But, though the process worked smoothly on a small scale, it took two pilot units (*right and above*) to prove it out. The difficulty was found to lie not in the oxidation process but in the quality of the by-product hexadienal that was being used as a starting material.



Sorbic Acid: Tamed in Two Tries

The man who first said there's many a slip 'twixt the cup and the lip certainly didn't have Carbide and Carbon's sorbic acid operation in mind. But if he did have, he couldn't have hit upon a more apt expression. For Carbide has—with varying degrees of enthusiasm—been trying to make a chemical of commerce out of sorbic acid for fifteen years. Only this week, with the corporate vest looking none the worse for the many slips, it is shaking down a unit capable of making over a million pounds/year of sorbic acid at its South Charleston, W. Va., plant.

A large portion of the success of sorbic acid is due to the fact that it was found to inhibit the growth of microorganisms, particularly moulds and yeasts. And since it's also metabolized in the body, it's offering competition to sodium benzoate as a food preservative.

But bulking even bigger in the happy ending for sorbic is the stubbornness of a hardy band of chemists and engineers whose zeal for the product rose in direct proportion to the number of failures they met in their search for an economical synthesis.

Started in Oil: Carbide's first interest in sorbic acid dates back to the tung oil shortage during the early days of the war. Sorbic acid, it was found, could upgrade drying oils. For instance, by adding some sorbic acid and glycerine to linseed, you could get an oil equivalent in drying properties to tung.

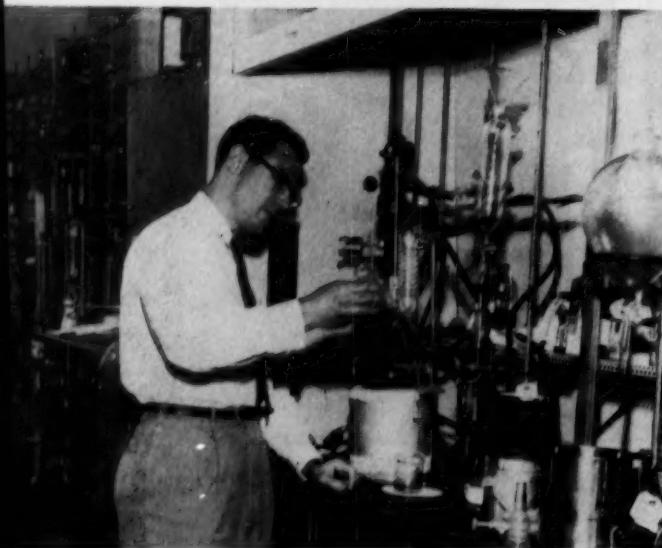
At this time, Carbide was using a condensation of crotonaldehyde and ketene followed by a destructive distillation to produce the acid. Although the firm turned out some carload lots of the material in this way, the process

caused corrosion problems. Moreover, the economics of the end use meant that the product had to be sold for less than 50¢/lb.

With the corrosion problem and price limitations in mind, A. E. ("Monty") Montagna and his group from the Process Development Lab, decided that the ketene process just wouldn't do. Instead they started looking for a way to make sorbic acid by oxidizing hexadienal (sorbaldehyde), which was available as a by-product of the firm's crotonaldehyde production.

This proved tougher than it looked; every effort resulted in chewing up hexadienal's conjugated double bonds as well as oxidizing the aldehyde group. Says Montagna: "We tried every technique we could find in—sometimes out of—the literature. But we worked for three months without

New Process for Hexadienal Made Sorbic Route Possible



Henry Chitwood (above) developed trimerization of acetaldehyde to hexadienal. In contrast with the sorbic acid portion of process, it worked so well it was moved directly from lab scale to commercial equipment.

turning up a single crystal of sorbic acid."

Finally, they went back to the only reference they could find* for oxidizing hexadienal to sorbic acid. That described a method based on silver nitrate. Although economically the reaction was out of the question (it takes 4 lbs. of the nitrate to make 1 lb. of sorbic), they tried it just to make sure that they actually had hexadienal.

They were able to make some sorbic that way and, encouraged, returned to the search for a practical commercial route. After a year and a half, they found it. By use of a catalyst; a specially shaped reactor; careful control of temperature, pressure and residence time; they found they could make sorbic acid by an air oxidation of hexadienal.

Hurry up and Wait: By the time they had polished the process on a small scale, however, interest in sorbic acid had died down. The process couldn't come close to turning out a

50¢/lb. product; and even if it could, the firm had only limited quantities of hexadienal available.

Then (in '45), Best Foods received a patent (U.S. Pat. 2,379,294) on the use of sorbic acid as a fungistat. The food use meant that the product could command a premium. But proving the product nontoxic was a long-drawn-out process. It wasn't until 1953—when, at a meeting of the Institute of Food Technologists, Best Foods revealed that sorbic was approved for use in cheese wrap—that Carbide's interest was rekindled. It rushed the lab process into an outsized pilot plant.

But the scale-up proved too big a jump, and engineers had to build a smaller pilot unit in the lab. After operating both units simultaneously in an effort to find out why the process wouldn't work, they found that the culprit was an impurity in the hexadienal they were using as a starting material. In the lab experiments, they had carefully refined the materials and had no trouble. This, of course, was not feas-

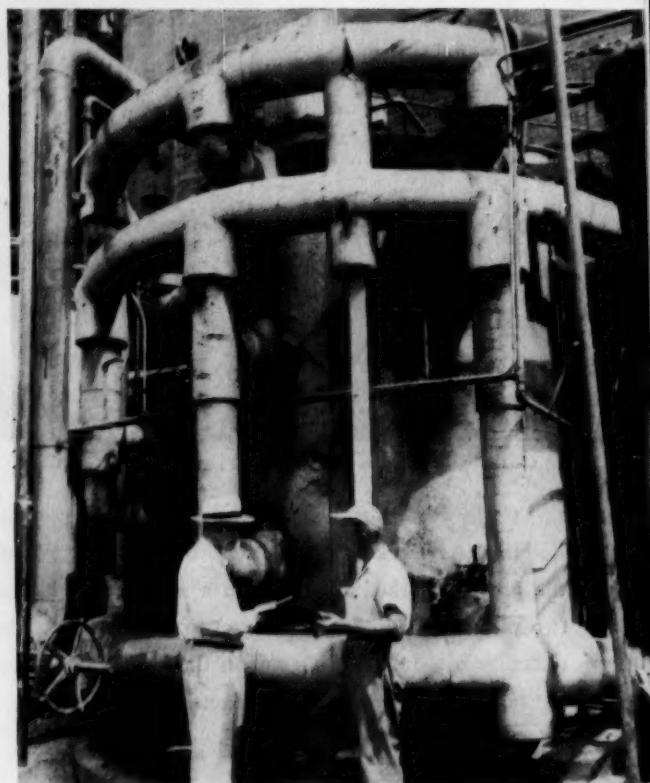
ible for a larger-scale operation.

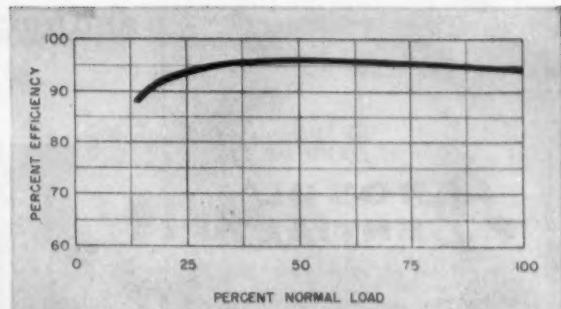
Improving the Start: Fortunately, in anticipation of a bigger demand, Henry Chitwood and his group of researchers in the Research and Development Dept. had been working on a synthesis for hexadienal. And this was proving to be just as tricky as the sorbic acid process, but for entirely different reasons.

Chitwood and his colleagues were attempting to form the six-carbon-atom hexadienal from the two-carbon-atom acetaldehyde. The trick was to keep the trimerization in a straight line. Finally, after a lot of trial and error, they worked out a catalytic reaction. Because it employed techniques with which Carbide was familiar and because it dovetailed nicely with the firm's other operations, the hexadienal process was moved directly from the laboratory to commercial equipment.

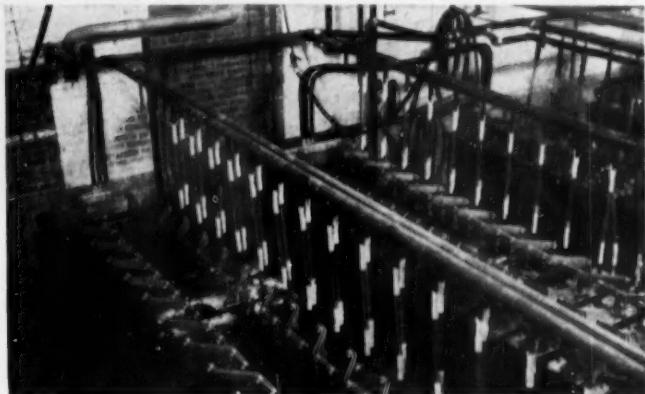
Make Ready for Sales: The availability of a good-quality hexadienal put an end to the sorbic acid pilot-plant troubles, and the engineering depart-

* Berichte, 59, 1926, p. 2663.





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. . . sorbic acid which is being examined by Montagna.

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ment went to work on the big unit.

Now that the technological problems are out of the way, the sorbic acid program is squarely in the hands of the sales staff. And winning general acceptance for it may prove to be no mean task. For one thing, sodium benzoate is firmly entrenched in a lot of uses, will be tough to dislodge. Then too, sorbic, at \$2.45/lb. is considerably more expensive than sodium benzoate at 46¢/lb.

But, as Carbide is quick to point out, straight cost figures are misleading. It feels that you can usually get away with using a lot less sorbic and that, on an efficiency basis, it will be able to hold its own in a cost com-

parison with sodium benzoate. Moreover, Carbide salesmen will make the most of the fact that sorbic acid—unlike sodium benzoate—is metabolized in the body. It even has some food value (18 cal./gram).

There's also the possibility that other uses might develop, although the price would have to be slashed before it could win many markets. Says Robert Bateman, director of Product Development for Carbide: "The important thing is that we now have an important use to hang it on. We'll develop others as we go along."

And if not, the food use could justify the sweat and toil spent in process development.

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plate come into direct contact with the fluid, permit measurement of temperature.

Multidimensional Indexing: A newly installed indexing system, says the National Bureau of Standards, is helping government scientists reach "the frontier of a particular area of investigation" in less time and may be doing it cheaper. The system, worked up by Joshua Stern, is based on the increasingly popular indexing system which the NBS calls multidimensional or multi-aspect indexing. The system is based on the realization that the same basic information may be sought from many points of view, therefore is designed so that the required information can be found at the common focus of a number of such search viewpoints.

For instance, a man who has perfected a method based on electromagnetic induction for measuring blood



East and West Meet the Future

While the U.S. process industry is hard at work ironing out process problems in atomic energy, and while scientists of both the U.S. and Russia are rushing to be the first to launch a satellite into outer space, the Japanese took an ad-

vance look at both ideas recently at the country's Space and Atomic Fair. Miss Haruko Sasaki (*above*) points out to four marines of the Third Division what the well-dressed space traveler of the future may wear.

PRODUCTION . . .

flow in an organism would look up cards under "flow," "electromagnetic," "induction" and "blood." If he found that work has been done on such devices and wants to know whether any patents had been issued, he would look up "patent" under a special category, "nature of document."

Valve Advance: The Fairbanks Co. (New York City) is out with a new valve that features a renewable seat. In fact, says the maker, all that's needed to put in a new seat is a screwdriver and about 7-10 minutes. The quick change has been made possible by eliminating the need for removing the valve from the line. Instead, the bonnet is disassembled, the seat rings are unscrewed and re-

moved and the new seat rings replaced. The valve, it adds, has proved highly satisfactory under a test period of two years.

Fission and Fusion: The Atomic Industrial Forum, Inc., surveyed 32 nations which are known to be interested in atomic energy. It found: 42 reactors are now in operation (most of these—29 in the U.S.); 20 are under construction (9 in the U.S.); only one is in operation and one under construction in Russia, according to official Soviet announcements, although it's believed that several others are either working or under construction. The survey also reports on nations with workable deposits of thorium and uranium, cites available informa-

tion on atomic programs in the countries covered in the study.

• The National Industrial Conference Board early this month set the date—Oct. 26, 27, 28—for the first "open and unclassified" discussion ever held on the harnessing of thermonuclear energy for peaceful purposes.

Wet Weigher: Richardson Scale Co. (Clifton, N. J.) is introducing a new scale which, it says, can handle non-free-flowing materials as well as dry aggregate materials. It's a differential scale called the weigh-in & weigh-out scale, consisting of a weigher, dial scale and totalizer. It is electronically controlled but can be operated manually.

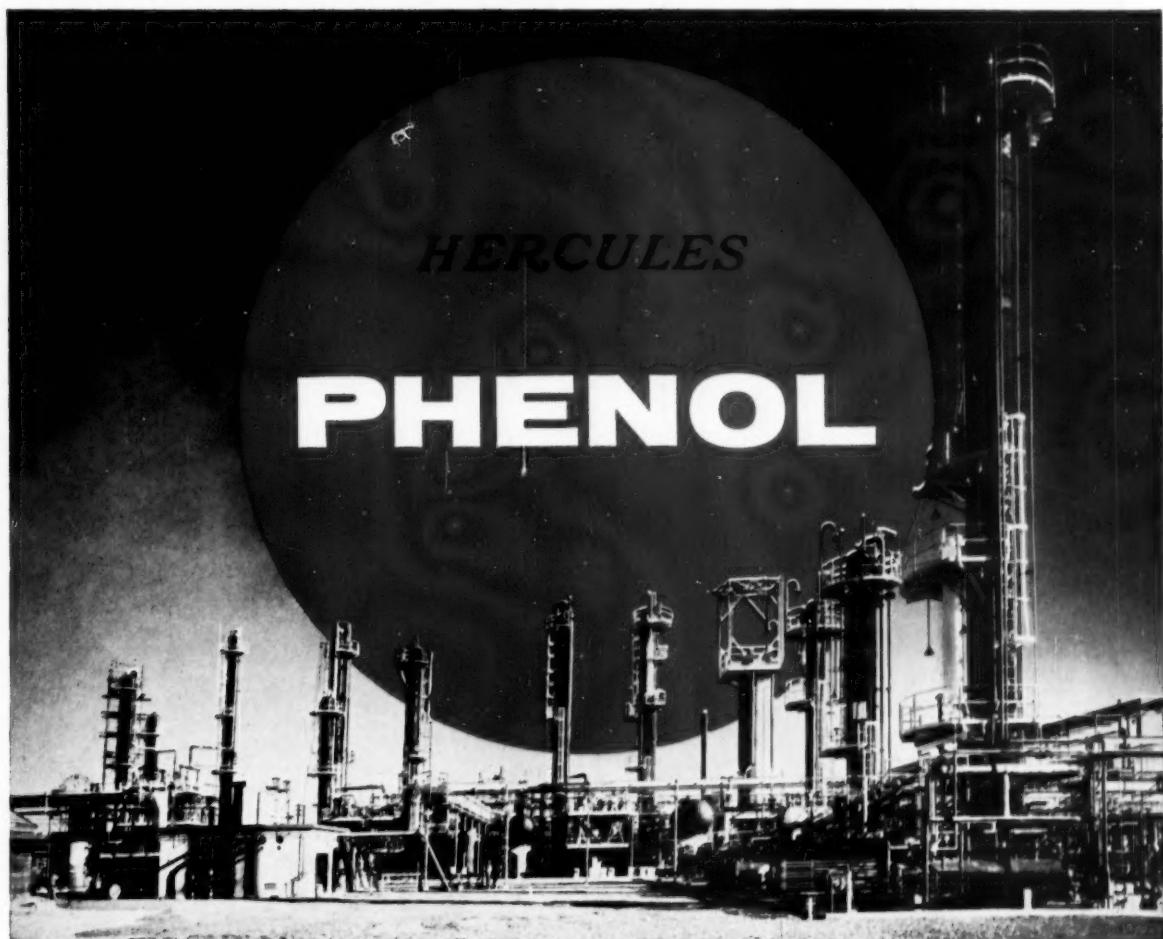
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for Imperial Chemical Industries Ltd., and the phenol-from-cumene project for B. A. Shawinigan Company.

The M. W. Kellogg Company can assume responsibility at any point. In Hercules' case, engineers of both companies collaborated in engineering the process and the mechanical design of this phenol-from-cumene plant. Hercules supplied the process for producing phenol-from-cumene. Kellogg supplied the process used for making the cumene feed. Kellogg erected the process units.

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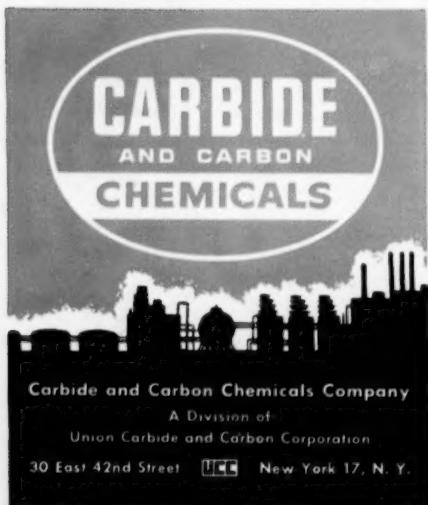


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FLEXOL Plasticizer DOP (di(2-ethylhexyl) phthalate)—the "standard" plasticizer for vinyls for more than ten years.

FLEXOL Plasticizer 426 (a mixed alcohol phthalate) saves you money and offers quality, too.

FLEXOL Plasticizer 810 (a higher alcohol phthalate) is outstanding for its low volatility and the improved low-temperature properties it imparts to vinyls. Plastics made with 810 have excellent viscosity stability.

FLEXOL Plasticizer 10-10 (didecyl phthalate) is the least volatile of phthalate plasticizers—it has good electrical properties and is a good dispersant, too.

FLEXOL Plasticizer CC-55 (di(2-ethylhexyl) hexahydrophthalate) is an excellent dispersant for vinyl plastics with stable, low viscosities.

To be sure you have the right phthalate every time, call or write the nearest CARBIDE office. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Toronto.

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